S. Africa + Australia
1965-66 (dlb + ESB)

# RECORD

Boston → Europe →
E. Africa → S. Africa →
Maylasia → Australia →
New Zealand → Pacific
Islands → Boston

Feb '65 – May '66

Thursday

Feb 4 Left Boston - Alitalia DC-8 - at 9 PM
Very cold night but perfectly clear. Had
dinner at Union Oyster House with Team
Langenheim. Arrived at airport with
plenty of time.

This terminates what to me has been
a most hectic few weeks. The details
of things to do not only for the two of
us, but also for the students and
other duties seem legion. I suppose
one can become slightly obsessed with
such matters before going away on a
long trip. It was a feeling of great
relief to finally get off the ground.

For the night flight to Rome - Tourist
- Economy, The airline (Alitalia) does the best
they can to make one comfortable. Food
excellent, in fact a very fine filet
mignon and the rest typically Italian.
However found it almost impossible
to sleep the whole night through - in
fact arrived at Milan quite exhausted

Feb. 5 Friday There was a long drawn-out dawn
starting somewhere in the Western
Mediterranean - it was full daylight
when we touched down at Milan. How-
remarkable to see green grass and
bare ground after these endless

weeks of snow and freezing at home - and Milan is actually north of Boston in latitude! Coming in some time before landing there was a most impressive view of the higher Alps to the north - an incredible jumble of snow-covered peaks + deeply dissected scarps - also most forbidding looking. Milan is in a rather flat valley, but fairly high mountains not far to N. and W. The airport is very modern, functional, and nicely furnished. Details of decor and internal construction quite unlike any U.S. airport I have seen. Also there is an immense runway area - all concrete covered - squarish slabs - probably the ground freezes here little if at all.

Left Milan for Rome after about an hour. Arrived Rome about 5:30 AM Boston time (11:30 AM local time). Here the landscape is truly green and yet the trees show it is mid-winter. The Rome airport is large and very efficiently arranged. Got through and on the way to the city in short order. The airport is quite well out to

$1.00 = 621. Lire

The southwest of the city. From downtown air terminal took cab to Hotel Imperial on Via Veneto. This is a good clean + reasonably priced (2nd class) hotel.

Was so tired my early impressions of the city were rather dulled. Slept much of the afternoon and had late dinner at a restaurant close by down the street (Via Veneto). Was quite mild this afternoon (50°F) but chilly this evening (40°F?)

Feb. 6
Saturday

A day never to be forgotten. Not having been to Rome before I had no real conception of the extent of the remains nor the scope of the ancient city of Rome - nor did I realize how completely modern Rome envelopes and yet blends in with the old city. The sight-seeing trip to the landmarks of the ancient city was interspersed with stops ~~for~~ to see some of the well known + famous landmarks of the Renaissance - most notable the Borghese Villa and Palace - now a Museum of the finest sculptures in Europe. The tour lasted about three hours and at a very reasonable rate (3000 Lire

for two persons). We bought food and wine locally and had lunch in the hotel room. After lunch - (The lunch food, except for the rolls was not at all cheap) - walked down the Via Veneto, turned right (west) on the Via del Tritone and down this to intersection with Via del Corso - south (left) to the Piazza Venezzia. This is a most impressive sight although it conjures up in mind clear memories of pictures seen years ago of Mussolini and his worshipful hordes gathered in front of the giant steps and marble building. Continued on to spend the time until near dark at the site of the ancient Roman Forum and the fascinating square on Catoline Hill - where Michelangelo designed the most remarkable hill top of "modern" Rome

Weather was clear all day with chill NE wind. About freezing early but in upper 40's in afternoon. Excellent dinner tonight at the Tovernetti restaurant, close by to hotel on Via Sistina near the Via del Tritone.

Only unpleasant event of the day was the malfunctioning of the Bell & Howell movie camera - and this for the first time in over 18 years, and ironically only after it has just been overhauled (nothing was found wrong).

Feb 7
Sunday
Rome

Visit to Ville d'Este & the gardens & fountains. Brilliantly clear morning - Stopped en route to visit the huge remains of the Villa of Hadrian - now reduced to remnants of walls & a few other structures - mostly a "real" remnant.

Excellent supposed model in museum.

The fountains at Villa D'Este are superb (powers & lighting "donated" by " - - - of Italy

Constant stream of cars coming from Rome out to country

Trip to airport - left hotel at 2 PM - Arrived on time for 4:10 flight - Weather

Rome - building stone - Tuffa

unpredictable

The source of much of the stone structures in Rome seems to be of the most ~~[illegible]~~ known to man and this fact in some ways explains ~~[illegible]~~ the remarkable selection made in choosing the various items for ~~[illegible]~~ sculpture

~~A Question~~

~~A Question~~

~~A Question~~ A.

Item — Alitalia made all arrangements very liveable + incl. a very poor lunch + drinks. about 2 hrs in to the airport

Feb 8
Athens
Monday

Ever since arriving in this country, as of this AM, everything has been wrong. Arrived at the airport, an hour late last night to be greeted by wet snow in the face + strong winds (it never snows in Athens). Everyone was in a frantic rush to get out of the plane + in the pushing + pulling tore my coat. Taxi driver in Athens cheated me 30 Drachmas on cab fare ($1.65 instead of 65¢). Went to Olympic Hotel — bar prices higher than in U.S. Dinner at hotel since

it was too cold to go out. Only one item on menu: Fish course supposedly filet turned out to be a whole fish fried with all the bones and tail on it. Dorothy got a bone stuck in her throat. The "veal" turned out to be overcooked stringy superannuated cow probably cooked a week before + ghastly tasting. mashed potatoes about hash house variety. No coffee. Head waiter an uncommunicative but officious old bastard. Tried to walk around town after dinner but too cold to keep up with it. Returned to hotel room - no heat. No hot water [This is a First Class hotel!] Not enough blankets - had to use overcoat for additional blanket. This AM tried to make hot coffee but found the electric outlet equipped with automatic cut-off for high amp. circuits - enough of this

Later - Spent the AM walking around + exploring this area of Athens (Hotel Olympia) The city is a curious mixture of what I know of Mediterranean culture with what appears to be Slavic influence - at least in the architecture + general appearance of adaption of the people to their physical setting. The maze of streets + alleyways is greater in

complexity than any I have seen.

Without more than a map and no other aid we succeeded in getting up to the Acropolos & others with a minimum of difficulty - and what a reward despite the piercing cold wind ( who would have anticipated slipping on the ice on the puddles in worn stones of the Greek Temples of Athens ). Fortunately a bright sun from the west and we started down from the Acropolos as the sun set — a wonderful layat for photography — but so much more so for an unforgettable memory of the marvellous physical accomplishments which this scene presents — How could these people without access to what we now know engineer this ?.

Walked through the crowded streets about 6 PM — & it was very cold — back to the hotel. Shopping seems to be at a peak about 6 - 6:30 - streets jammed with people — and stores which were closed all afternoon until 4 PM or later? now all open.

Feb 9. Left in hotel. Started tour at 8 AM to Corinth, Mycenae and Epidaurus. This was a marvellous day from any point of (personal) view. Can only catalog impressions in this directedly impressionistic account. Bright sunny day, but cold (ca 37°F). Left Athens about 8:45 on road to Corinth. From outskirts of Athens new road (toll) to Corinth. Excellent roadway, although narrow by U.S. standards. Remarkably little traffic except more trucks proportionately. Few "commuters by car". [seems more like my memories of Spain in 1957 than anything I have seen since in the environs of a large city (Athens area = $2 \times 10^6$ population) but a relief to see compared to US cities].
First stop = Corinth Canal (French 1884?) cut 200 ft deep & 3 km between the gulf of Corinth & the Gulf of Salonika — seems to be a slot canyon in soft rock — the channel only 28' deep — We wonder the French thought they could build a Panama Canal!. Saw oil refinery en route to Corinth — the Valvoil refinery.

All rocks on cuts of new highway seem to be soft, deeply weathered conglomerate or slightly metamorphosed sediments of complex structure. The relationship of

the high relief of the mountains to the pediment and coastal "plain" deposits is difficult to see. Tectonic activity & a history of recent earthquakes explains only a part of the complexity.

Have seen no intrusive or extrusive igneous rocks on the entire trip to Epidaurus and return. Most curious rocks seen are the conglomerates at and about Mycenae which are composed of remarkable assemblages of water worn pebbles (2"-3" diam) firmly cemented in a matrix of sandstone & chert? forming a remarkably durable rock which forms the base of the structures not only at Mycenae, but also in part at Epidaurus.

How did the Greeks - & Proto-Greeks happen to have found so many lithotypes so favorable & developing their special talents as stone workers — or is this, in part the obverse of the reason?

For whatever favorable combination of circumstances the creations of the architectural achievement shall remain a wonder of the western world. E.g. The patio of Epidaurus and the frieze - The intricacy of the design on the outer rotunda - and the

remarkable acoustics of the Theatre itself.

These are tricks to show the tourist but how poignant to explain to oneself when he realizes that this is real, was real and still is as an achievement in engineering which we are yet strong for in our more precise ways.

Epidaurus – much snow on ground and in Theatre – tree limbs broken in many areas along walk by the heavy snow. This afternoon the snow was melting fast beneath the overslay of warmer air and the February sun.

In the fields here-around it is evident that spring is almost here.

The Orange Festival at was held yesterday – there was still a great pyramid of oranges – perhaps 15'-18' high in the town square.

Observations today –

many sheep. Few goats. almost no cows or either evidence of any stable dairy industry

mostly mixed olive orchards with sporadic undercover pasture or

none at all.
Mixed citrus orchards with cover crop between rows, or none.
Few tractors for power — None seen above 30 - 40 H.P.
Many low HP. 2 wheel "garden-type" tractors used for front end tractor for trucks to ship to local markets.
Few crops seen going to market -
This

Feb. 10 - Cold rainy day. Intermittent thunderstorms and cold rain.

Feb 11
Cairo.

Arrived last night after a quick flight via Swissair - Caravelle. Marked change in weather - quite warm & pleasant here - in fact uncomfortably warm today after the unbearable cold in Greece. No room at Atlas Hotel, but secured room at Cleopatra Palace Hotel - first class and very good - on 12th floor facing south. The central circle between here & the Nile Hilton is just below and to right. Excellent view of the Citadel (XI Cent walled city & mosques) to SE.

Walked about the city. A huge city and for the most part not too clean. Well policed and orderly. Reminds me more of some Spanish cities - esp. Valencia than any other I have seen, but much larger. City transportation

Cairo
Feb. 12
Friday

Friday is supposed to be a holiday in Cairo but it is a difficult one to understand. Something like Bunker Hill Day in Boston — a guessing game to know what will be open.

Spent most of the morning at the Egyptian Museum. This is a must for any visit to Cairo — the museum itself is for the most part pretty shabby as exhibits — much totally unlabelled, much poorly or scarcely legibly labelled. The exhibits of tomb of Tut 'Ankamun are the best — a truly fabulous display of the worldly goods of a Pharaoh. Amazing how the Egyptian kings took them here-after so seriously

afternoon — the pyramids of Ghiza. Taxi from hotel 50 piastres. As soon as we started up the road where the taxi left us the camel boys started to plague them two camera-toting tourists. It took all the way around two sides of Cheops to get rid of them

The pyramids, the Sphinx and all the ancient Egyptian art and sculpture have an extraordinary

uniqueness, but possess none of the beauty and inspiration of the creations of the greeks - either architecturally or purely aesthetically. But the sheer mass of these pyramids does overwhelm you - and the thought of how it could possibly ever have been done by human labor alone!

Dinner at Goppi Restaurant - rather indifferent food. Dinner + wine = 152 pesetas

Feb 13

Geologic Museum –
Pyramid + Sphinx = Middle
Eocene – outcrop to SW = Pliocene
Most of valley area N of
of Cairo is not into Eocene
to Pliocene sediments
Nile valley in the Cairo
area varies from ca 10 - 25 km,
north of Cairo widens rapidly

Amber exhibit – source ?
# 31811 is number in case
King Farouk collection – designated
Oligocene – received by Museum
in 1956

2nd Floor central section all vertebrate
– mostly Middle Eocene. West
section invertebrates + some
fossil plants – Carboniferous – Cret
wood, Pliestocene bones.
Preservation all as casts, molds
and impressions
East wing = all invertebrates
Cret → recent (some Carbon –
iferous)

Most of the museum collections

Ahmed Talaat.
Geol. museum. Cairo.

Ass. Prof. Dr. Rushdi Said.
Tel. 35120 Extn.
Dep. of Geology Cairo University

[Noticed today that Aeroflot (USSR) has a very small office on a side street near the hotel here]

seem rather pathetic - hand written labels, many faded so as to be undecipherable. However many of the invertebrates are named with hand printed labels, giving age

— Small specimen of Cold Bokkeveld meteorite Spec # 13070 — ca 10–15 grams

# 13507 — Renazzite = black chondrite - Vigarno Italy, 1910

# 13073 - white veined hypersthene chondrite. Nocs, Transylvania 2/3/1882

Restaurant Pillon ? lunch 258 pistres

Baba Ranoud ← sprinkle w. parsley (Egg plant in Sesame Sauce) — other Mixture (like mustard is Sesame Sauce)

Soup de Net - Mediterranean fish (sauce portugese = tomato, w. fine Chopped onion)

Later today visited very briefly the Egyptian Museum mummy room. Here are row on row of the mummies of the Pharaohs + their wives - only a few of the latter. The

preservation of flesh + skin is extraordinary – toe nails + finger nails + hair. Also the delicate cloth wrappings. Most of those noted were of the later dynasties, Ramses II + III etc.

facts given on British TV show seen in hotel room 7/13/65

10,000 million cubic yards of the Aswan Dam lake will evaporate each year.

The dam will require 25,000,000 cu yds. – 300 + feet high, 1000 yds wide at base.

The Nubians to be moved out of the Nile valley will be housed in 50 villages in the desert – This solution to the Nubian population problem determined by the Egyptian govt.

Purchased items at Zossar Bazaar late this afternoon. 1. Camel saddle, 1. rug; 6 yds Egyptian cotton material; 1. jewel stone; 1 ornamented box; 2 hassocks. ~~$81~~ $67.20

Learned tonight that the number of U.S. tourists dropped from 56,000 in 1963 to 1,000 in '64 to Cairo. Reason? — perhaps burning of Amer. Univ. Library helped to bring this about

Fortunately found out before mid-night that hotels in Cairo will not accept Travellers checks. Had to go to bank in Hilton to change ($ bank open 24 hrs / day)

Feb 14. En route Cairo → Nairobi. Dawn came soon after leaving Cairo (on De Haviland Comet 4). Plane nearly full up. Left airport ca 5:30

With full sunlight was possible to see the absolutely barren desert of Upper Egypt. Many puzzling features in the desert terrain — appearance of drainage systems in what is now absolutely devoid of vegetation — probably never rains. Over the Nubian Desert about 7:45 The Nile meanders across this wasteland like some incongruous intruder — highly braided stream in places. Irrigated areas show lush green. There appear to be remains of human activity here & there west of the Nile — in what is now desert — forms of what may have been towns or villages. About 8 AM some

Pictures of Nile somewhere in Northern Sudan.

signs of scrub vegetation, but curiously blocked out in straight lines or irregular geometric shapes.

Glare of light from the desert is intense & blinding.

Passed south end of Lake Rudolf - to the west - at 9:30. There is no evidence from this height of human occupation along the lake? Country side still extremely arid looking & barren to east of the Lake - west side too far away to see clearly.

Some forest cover on mountains of Ethiopian Highlands north & east some hundreds of miles from L. Rudolf.

Passed the Equator at 10:00 A.M. & just beyond to the east & close by to our course was Mt Kenya (17,000+ ft) Considerable snow cover in the eroded valleys on all slopes - seemed more on south side of mountain. Dark forest cover but plane too high up to distinguish vegetation types clearly.

Started down to Nairobi airport shortly after passing Mt. Kenya. Landed about 10:20 (local time 11:20). It was a surprise to step out into the warm

but not hot (80°?) air, so dry as to feel like desert winds. Cloudless sky.

Nairobi airport is small, neat and very functional. A minimum of time to get through the entry rig a marvel. However, hotel accommodations very tight because of concurrent session of leaders of the OAU —. Secured quarters at the Hotel Salisbury on Ainsworth Hill - 2nd class but clean and neat - a series of low one-story cottage-like buildings.

Nairobi is a clean modern city with beautifully landscaped roads and avenues — all so bright under the equatorial sun. Dinner + bed early after almost no sleep last night. As soon as the sun set it became remarkably cool. The brisk to strong NE wind dropped off quickly, however.

Feb 15 To town early. While waiting for Nairobi the bus we were picked up by a passing car - probably an Indian business man Took us into center of town.

Haircut - 3 shillings (44 ¢)

Made arrangements to visit the Nairobi National Park near the city. This is an area of 40 sq. mi..

This afternoon visited the Park - had

a car + driver and a native park ranger as guide. Spent over three hours going from place to place determined by the rangers knowledge of where to find the various animals. Hope the photographic record can restore the remarkable memories of this bright sunny late afternoon on the sweep of the savanna here which seems to stretch unbroken to the distant mountains.

Because of the altitude here (5500 ft), the cool mornings (55° this AM), the steady dry breeze, and the cloudless sky it scarcely seems credible that we are almost on the equator. Only the sun at noon keeps this fact of geography in mind.

[ "Student" demonstrations today at the O H U conference occasion — in front of U.S. Embassy bldg. against the Congolese bombing of Uganda — ]

[genus Faurea sp saligna - huge rays in wood

Feb 16 - Coryndem Museum this morning. Nairobi This is an exceptionally well done small museum. Habitat groups for the animals are on a par with some of the best museums in the States. The taxidermy of the larger animals is superb.

Perhaps the most competent exhibits ~~but~~ scientifically are the botanical exhibits - although done in drawings, etchings, & other illustrations - not actual specimens - However, all plants illustrated are carefully classified - family, genus & sp and additional information on representation in Africa in reference to world-wide occurrence.

Swimming This PM 2-3:30 at the Salisbury Swimming pool. Well kept & clean. The temperature of the water a great surprise - probably in upper 60's S. F. Apparently the long cool nights keep more than pace with the equatorial sun.

Politically this is a complex situation in Kenya - almost the reverse of "white supremacy"

Feb 17

on route Nairobi ⇒ Johannesburg

Took off almost on time - 9.40 AM Shortly later the towering peak of Mt Kilimanjaro could be seen to SE - snow capped and standing above the clouds. Another high mountain to SW of Kilimanjaro name?

Clouded over and nothing visible until just north of Zambezi River - the Zambezi is a huge braided stream in this part of its course - Port. E. Africa -

Much of the country south of Kilimanjaro is forested & notably uninhabited - or at least no roads or towns.

Landing at Salisbury So Rhodesia at 12 Noon. Sky clear - pt cldy Temp 70° F & after landing I concluded it was near 80° F, but the air here is dry and even under the near vertical sun it was pleasant in the breeze. Salisbury airport is small but neat and clean with excellent transit passenger facilities - The countryside around about here seems very well tended and prosperous. Also there appears to be a very extensive network of

* The most conspicuous tree in this whole area & countryside is Eucalyptus. Plantations and otherwise planted.

roads (few paved) covering the flat land areas. Scattered patches of forest here & there especially near the hills & ridges which appear to be of considerable height.

One hour & 50 minutes to Jo'hburg from Salisbury. Scattered cumulus to towering cumulus – the latter chiefly to the east & S.E. some very high anvil clouds. Landscape arid to semi arid – red soil, savanna & isolated forested areas. After crossing the Limpopo even the landscape seems more "developed" – roads etc. Came in to Jo'burg airport about 1:15 local time (2:15 Nairobi time) Quite warm & more humid the Salisbury, Pt cldy with thunderstorms nearby. Took bus to Pretoria, but much trouble to get hotel accomod. Took bus to Jo'burg. A very obliging passenger, whose name we did not get helped beyond measure by taking us to Hotel in Jo'burg – Victoria – in his car.

Feb 18 & 19th

Univ. of Witwatersrand – last two days.

Prof Pretoria series ± 1000 M
Transvaal 2000 My
Ventersdorp > 2000 My.

! copy of Weaver + Clements Plant Ecology in Dr Hails office

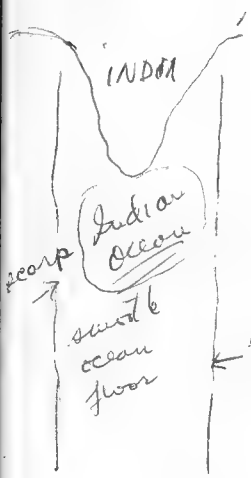
8:05 PM

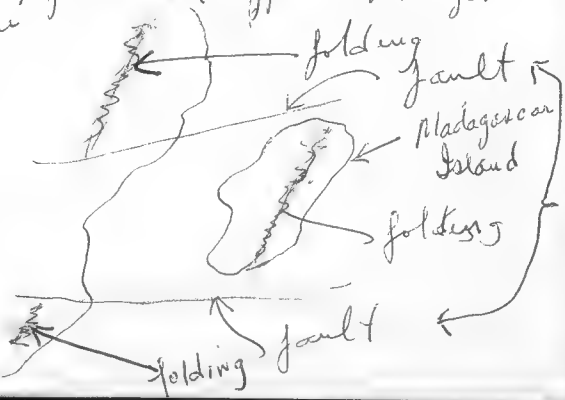
Feb 19th. Started out for restaurant several blocks away – suddenly lightning in the south + west + a violent storm came over. Heavy to heavy rain for 10 minutes, then hail – copious fall out of stones ca 1/2 – 3/4" – intermittent for ca 10 minutes, then rain tapering off. Estimate that well over 1" fell in 20 minutes. Mue cooler but wind dropped off sharply – apparently not a "cold front".

Hart:

Gondwana flora i.e. glossopteris –
Eastern Congo – megafossils
Dwyka tillites – bona fide tillites
varved clays + distorted tillites – ice pressure deformation
Ice movement from NE as African coast – sediment
Madagascar – fold zone in east Africa set off in Madagascar

Drift?



Permian Karroo coals - oömycetes in macerations made by Shultzes reagent.

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evidence of Dwyka equivalent tillites in Saudi Arabia (Aramco geologist in Dhehara?) - spore assemblage ca. same as in Tankanyika Permian

Tankanyika Permian closely resembles So. Afr. Perm. spore assemblage.

On basis of microfossils there seems to be a much more reasonable approximation of the so-called "Gondwana Floral Province" to the Cathaysian than one would surmise from the megafossils alone. However still in sharp contrast to the Amer. - Eurarasian coal measure assemblages.

Northern known limits of glossopteris foliage = i.e. Gondwana "Province"

Africa { Kenya (Mombasa area - No palynology)
Congo - eastern (see Hoeg)
Uganda - ?

India → Talchir boulder beds

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Plumstead:
Ecca coals are above the Dwyka tillites evidence for 4 or 5 glaciations.
Early glossopteris may be Up. Carb → L. Carb!

Feb 20 applied for & paid (4.25 Rand) for visas to Mozambique.

Mrs Plumstead picked us up at 12 noon today. Visited "The ~~Wilds~~ Wilds" - a city park area - large plantations of native and Cape herbs & trees. Bowenia, Stangeria & Eucalyptus introduced - seem to grow well.

Lunch at restaurant in Zoo Park next lake.

Tea at Jo'burg country club - a very beautiful area & fine plantings Liquidambar, Fraxinus, Cedrus deodara, grevillea etc grow excellently - also Quercus robur.

No rain or threat of it today. The hail damage in parts of the city is hard to believe - some trees almost stripped bare. Rainfall was 2 inches at Jo'burg meteorol. station. In Mrs Plumstead garden a great mass of hail was still mounded up unmelted at 2 this afternoon - The pile had been floated in by a rush of water downslope & stranded.

Some new faces on So Afn. scene. Television is banned by the government - a variety of reasons

are seven, but apparently the most important is to suppress the use of English as a language all bottle stores close Saturday at 1 PM.

* Of all areas of the world the Witwatersrand has the highest frequency of lightening!

Movie tonight — a Hollywood extravaganza - The Long Ships -

Feb. 21 Several hours in the park in Joburg lunch at the E. African Pavilion. Two hrs in the Geological Museum which is on the 2nd floor of the Library on Fraser St at Market.

Ordered wine for dinner at 2:45, only to learn no drinks sold (incl beer) on Sunday in restaurants except between 12 noon & 2:30 & from 6 PM on. Also found later before evening meal that one has to, by law, show his hotel key in order to obtain a drink in the hotel lounge.

Weather pleasant, pt cldy, some thunder showers locally, but mostly to north & east.

An indestructable memory of South Africa is that of the remarkable squeaking of my hard smooth rubber shoe soles on the remarkably waxed floors of S. African hotel & public building floors. The floor wax consumption per capita must be the highest in the world and

2/22/65 – Package mailed to U.S. Overcoat + papers – R 2.30.

probably owing to cheap labor costs for spreading. In the hotel teams of black lackeys seem to be busy all day in spreading the smelly stuff over every square inch under foot, incapable of being under foot. What makes the nose worse perhaps is the widespread use of parquet wood floors – even the Johannesburg station (old station) is floored with wood – not waxed!

Feb 22.

Up early but it served little purpose since we could not have invented more obstructions to constructive use of time had we planned all night.

Reserved car AM – was routed before we arrived – by 10 minutes. Arrived at Pretoria to contact Govt. Survey officials 10 minutes late (they close at 4 PM!) Went to Printing Office – arrived 5 minutes late – close at 4:30. Tried to contact at Civic Pretoria + ended up at Beesmeer School (going full blast) – found that the Arts + Sciences is 2 miles away + closes at 5: PM.

Got double room at Hellenic Hotel – R 7.00 for night – on church (Kerk) St.

Feb 23 Overnight at Hotel Hellenica in Pretoria (7 Rand) Paid for Okpst but up too late to have it. East on road to Nelspruit. Very monotonous, stark country until area of Machadodorp where the Pretoria Series rocks become dissected by drainage to the east. Stopped at Machadodorp and collected on outcrops + cuts along road N of town - black shales. Descent of the E. African Tableland some — miles W of Nelspruit. Very unusual and striking topography. Vegetation hard to classify - not Medit. chaparral, yet comparable except for the green (grass) slopes and dwarf forests not scrub. Valleys + bottom lands with lush trees + tropical plants (banana, mango etc) Towns are planted with Royal Palms, Pandanus etc.

Topography = mountain peaks (granite bedrock) devoid of trees = Sporadic plantations of PINUS ——— ?

Overnight in Paragon Hotel in Nelspruit. Nelspruit is a small, clean and seemingly very prosperous town.

2/23/65 Weather pt. cldy. with cumulus - no threat of rain. Country side very dry - evidence of drought is quite apparent.

Feb 24 Up early - 6:20. Left Nelspruit at 8:30 AM. Most unusual view of the mountains to the south & spent about an hour in photography on way to Barberton. Arrived at Mine office (E.T.C.) too late to meet Dr Gribnitz

Eastern Transvaal Consolidated

? Went off to the Agnes Mine on mountain road to Sw. Collected samples from road cut below lower Agnes - cherts. Samples from mine dump appear to be black cherts.

carpentitite? yes!

Visited the Sheba Mine this afternoon - arrived 3:30. Mr Wester was most helpful & cooperative. Collected specimens from the most recent core (1000') taken in the mine - This is a complete core through the Swaziland System in the Sheba Mine operations. Principal lithology = "graywacke" - cherts

(black cherts are known in mining terms as "bar") Bar means in miners terms barriers to gold emplacement in the sequence. "Bar" is essentially black chert. Black or highly organic shales are rare in the Fig Tree formation - also highly altered or difficult to characterize between metamorphism and primary structure.

On the road to Barberton + the Sheba mine there occur numerous outcrops of a dark shale, but the organic content is not possible to assay by inspection.

Took th[illegible] over the mountain back to B[illegible] lane road over th[illegible] S West - [illegible] all the appurtenances [illegible] fever.

Gold on buck[illegible] rolleys run down slope from Fairview Mine to the smelter plant. [Question - what is the smelter operation? Pyrites?]

Later -

arrived at the Impala Hotel about 7:30 tonight - tired + very dirty from the field. Dinner and vantage very good. On the way out of dining room met Dr Nicholaysen + Dr -

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Took the road over the mountain back to Barberton. A one lane road over the "hills" Reminiscent of the U.S West - abandoned mines and all the appurtenances of the bygone mining fever.

Gold buckets on trolleys run down slope from Fairview Mine to the smelter plant. [Question - what is the smelter operation? Pyrites?]

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Allsop (sp?). Spent two hours with them on problem of So. Afr. Geology and especially geochronology. I am not convinced that the "whole rock" approach via Rb-/Sr is the ultimate answer to dating older Pre C rocks. However, I have no new ideas to offer to the general problem which I think lies in the concept of Metamorphism & what it means in Pre-C sequences — That is — what are we dating — Events, — or Average Time of deposition.

Feb 25 Thursday Barberton, E. Transvaal.

Started out about 8:30 with Nicholaysen, Allsop & Albrich in their University vehicle & we in our Opel toward Louws Creek and the Daylight Mine of the Barbrook Mining Co up in the mountains 12 miles or so south of Louws Creek. After leaving the main road some miles west of Kaapmuiden went through large acreages of citrus and papaya. The

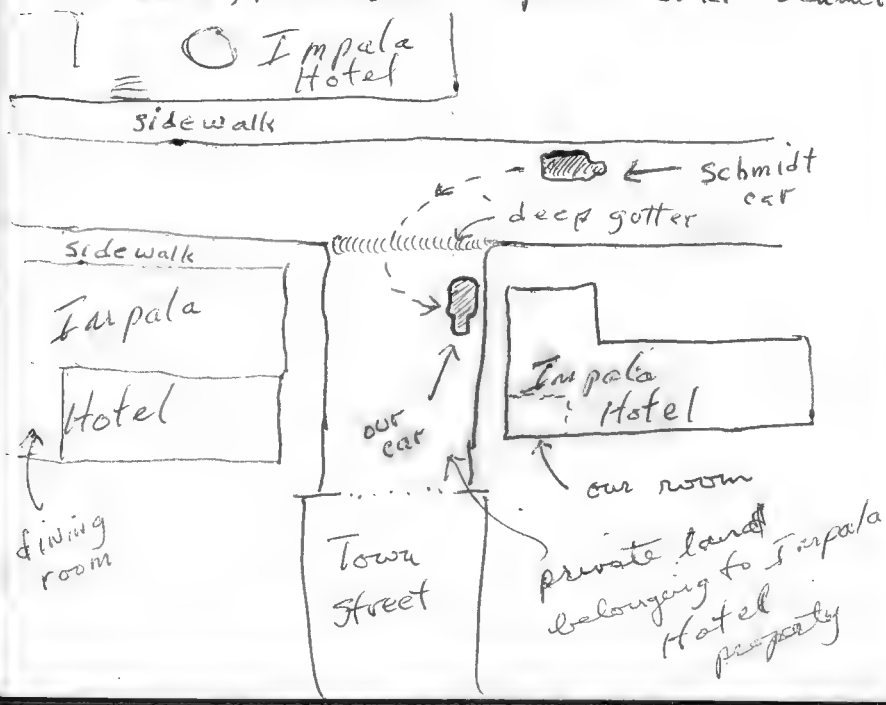
latter are just setting fruit - some trees still flowering. The intermontane valleys here are apparently very fertile. Soil a rich russet red brown. After leaving valley bottom and on ascent went through considerable area of sub tropical "rain forest" type heavy vegetation. After miles of winding road up the mountain met up with Mr Macauley geologist - prospector for Barbrook Mining. He + his wife have a delightful house (Company owned) on the mountain side here.

Collected samples here of dense waxy black cherts on road cut near mine. These are the best by far I've seen thus far in the Fig Tree formation. The University group collected sulfide samples, as pre arranged, and left about noon. We stayed on for the afternoon after a cordial invitation to lunch. Left after 5 to return to Barberton.

From the hill top at Macauleys it is possible to see the main trend, expressed physiographically, of the Barbrook fault - one of the major structural features of this part of the Swaziland system of rocks. A major portion of the gold mines are located along or near this fault zone.

Collected dense black shales from mine dump at French Bob Mine on way down.

This mine is on the Barbrook Fault.
These are the darkest, most carbonaceous shales seen yet
Got back to Barberton about 7 – nearly dark.
While eating dinner in hotel, the
~~[illegible]~~ manager, Mr — Murray came to the
table & informed me that our car – Opel – had
been hit by another car. The circumstances
of the collision were quite extraordinary.
The car which struck ours had been
parked across the street without brakes
set (in overdrive) and rolled across
street, turned 180° and crashed in
backside to ~~&~~ against the Opel. Neither
car was occupied. The car at fault
is owned by the Witbank Engineering Co.,
Witbank, Transvaal. Operator E. R. Schmit



The accident was witnessed by a number of persons including Mr Murray who offered his witness to effect the Mr Schmidt would pay all costs involved. The damages were entirely confined to the car door (right front) Other car had only minor damage to rt rear tail light.

I requested a police record, but at the Barberton station they declined to file a report since the accident per se had taken place on private, not public property.

Feb 26 Barberton, Transvaal.
Friday. To Sheba Mine early this AM. Met Dr Gibbity at ETC office. The U. Witwand group collected from the same core I sampled on Wednesday. Left B'ton at noon. Car ready by 2:20. Stayed in B'ton & packed rocks in afternoon.

Feb 27 ~~Barberton~~ Komatipoort, Transvaal.
Saturday This town about 2 miles west of the Mozambique border - down on the E. African coastal plain and hot & humid. A major rail junction and despatch point for the So. Af. railways Switch engines working all during early

evening hours.

Packed up & left B'hn about 10. Went back up to Macaulays on the Mountain above Louwes Creek & collected more of the fine black chert exposed west of the main portals of Daylight mine. Took about 30 - 40 lbs. Were invited to lunch but left about 1:30 after a cold beer with the Macaulays. They are most hospitable & friendly people - the children as well.

Collected more material at the dump of the Trench Bob mine. Also collected more black chert at switchback where abandoned road leads off to Vaseview Mine. This chert not as lustrous as that at Daylight Mine.

Last time attempting to enter the Kruger Park at the Malalane gate. This is closed at this season. Had to drive on to Komati poort gate. Arrived at 5:45 but too late to stay in park. Returned to Komati poort & put up at Komati Hotel This is a real old time hotel probably built when railway was put through here connecting Pretoria and Lourenco Marques (1895). A large & comfortable quite typically tropical hotel.

After dinner watched the watch

engines working in the large switch yard here, all huge 4-8 wheel steam locomotives (one diesel loco went by) of very large boiler capacity. Huge white hot fire boxes are hand stoked from coal tenders. General operation seemed very efficient & smoothly run. Large & well kept RR station (dedicated as a new station in 1945 & still building on to it).

Trains in So Afr. apparently haul almost all the freight. One sees no trucks what-so ever on the roads in the eastern Transvaal, except local delivery vehicles & relatively small size.

Weather cloudy A.M. Broken clouds & pt cldy afternoon. Wind East. In the valley below Louws Creek quite hot. Here in ~~Kat~~ Komatipoort warm & humid.

Vegetation — more & more tree covered but except in low valleys & slopes the tree cover is a wide spaced park-grass-tree parkland. No closed forest. This probably fits quite closely with the supposed 20-40 inch rainfall here in the valleys (500-1500 ft). On the mountain slopes it is difficult to assess the influence of climate on the present cover with that of man in the

grazing of the upper slopes. Around Barberton it is burning in the fall (May) grazing with sheep in winter (June – August) + cattle in spring Sept – December). How much grazing has affected the upper elevation cover is difficult to assess. Another complication is in the tree plantations. Whole mountain slopes are covered with a patchwork of pine (Pinus pinaster ?, Pinus "Oregon pine"? + Eucalyptus) plantations. This is a major operation here + the results are startling to see on the rounded far flung mountain slopes.

Pine takes 12 – 14 years for a harvest for wood (pulp + saw wood) and Eucalyptus only 8 years. All trees are planted by hand labor. – often in spots where logging is later not possible (This probably accounts for occasional giant specimens on the steep slopes.

Feb 28 Lourenzo Marques. Port. E. Africa

Sunday Up at 5:30 this AM & left at 6 for Kruger Park - Crocodile gate 7 mi N. of Komatispoort. Dull grey cloudy morning. Some drizzle after entering Park, but clouds broke about 10:30 - 11 AM. Animals abundant - especially the bucks - Impala, some Kudu, Wildebeeste, Hartebeeste etc. Proceeded very slowly for several hours and took over 3 hours to go from Crocodile gate to Lower Sabie. Between Lower Sabie and Skukuza saw Elephant, giraffe and several other genera. Impalas are extraordinarily abundant. They seem to prefer to congregate near the roads often in groups of a hundred or more. The roads are fairly well scraped 2 lane dirt strips made with minimal disturbance of the vegetation. Vegetation varies from south end of park from a park forest (very open with large tracts of grassland) to a sort of scrub forest with fairly tight overhead cover in places, isolated tallea trees but in general a park savanna. I have never seen quite such a vegetation type as this anywhere else

except perhaps some approach to it in the semi-dry areas of pacific slopes in Central America. There however the secondary effects of cattle grazing & burning are difficult to evaluate.

One of the most extraordinary aspects of the vegetation of the Kruger park in the area seen is the vast extent of destruction of the vegetation by the larger herbivores - i.e. giraffe and elephant. At first it seemed to resemble storm damage but it became evident that the destruction of trees was non-selective as to direction of fall or the position of broken limbs. Apparently a major effect of the giraffe population ~~is~~ ( elephants also ? ) is death of trees by girdling of trees in bark stripping. Literally thousands of dead but still standing large trees can be seen in the course of a few miles along the road. Many uprooted trees with earth covered root systems can be seen. One wonders if the current park forest is not the ecological consequence of these essentially highly destructive herbivores as well as the balance of rainfall & drought. In places the dead limbs & tree trunks

are in large masses almost faggot-like where the elephants have pushed them together. In places the number of dead trees is such that it reminds one of tracts of woodland where rising water level has killed the trees by drowning of root systems. This of course is not the case here.

At one point before reaching Skukuza came upon three full grown giraffes directly in front and in middle of the road & quite close. After a few moments of carefully observing us one of them - probably a large bull - began to charge the car. I was busily photographing it as the animal thundered down on us. In the camera field his head suddenly filled the field before he swerved to the right, went directly past the car a couple feet away & then "floated" to a stop behind and on the back on left side of the road. It was an uneasy moment but I hope recorded on film. The other two dispersed and we went on.

Reached Skukuza about 1:30. This is a fine main camp with restaurant and numerous facilities - so called huts & outdoor facilities for cooking etc. Probably a hundred or more "huts". The

number of people more than I had expected, but the place was by no means crowded. Had lunch & left by 3 PM Peabled Crocodile gate by 5.40 PM & reached the Mozambique border by 6:45. The road to Lourenzo Marques is very narrow (9 feet of tar + 2 dirt side strips) arrived Lor. Mar. about 9:30. Put up at Tivoli Hotel

This an astonishing city. After driving for 70 or 80 miles through the bleak & seemingly uninhabited countryside one comes quite suddenly into a modern throbbing bustling city, congested by cars & people. The wide [Avenida da Republique? This a broad main street with cars parked both sides & a one lane parking strip in center. After the relative quiet of the small cities & villages of the eastern Transvaal it is a profound change. Many aspects of European Portugal here, although everything has a more "modern" aspect.

March 1 Johannesburg

Left Lourenco Marques just before noon. In the AM light this morning with bright sky & strong sun the impression is one of a tropical sea port A large harbor reaches out through a narrow opening to the Indian ocean Pleasant sea breeze & cloudless to the east - cumulus building up over land to west. Excessively hot & still yet humid as well at the border near Komatipoort. Shortly west of the border the high lands of the Swazi-land system show up to S & W. The road follows close to the river level along the Crocodile valley, then about 25 mi. east of Nelspruit rapidly climbs. Lunch at Nel. prut late in afternoon. After dark & east of Machadodorp it became quite chilly - altitude here is probably over 7000 ft.

Stopped at Watbank & the auto accident. Arrived in slow stages in Johby. at 2130 AM

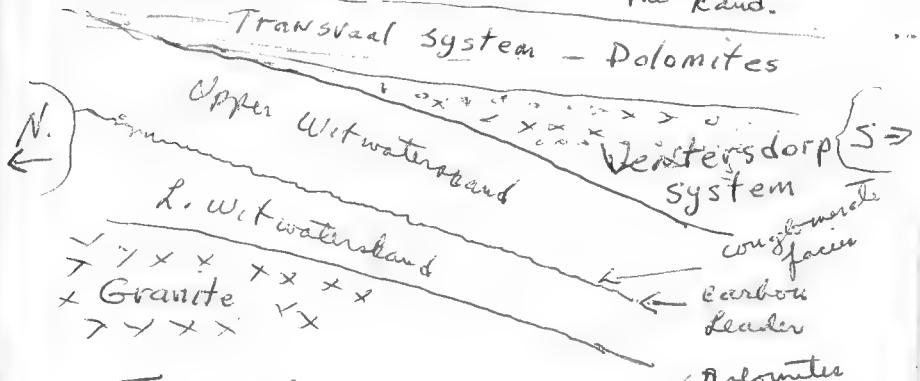
March 2 Johb. Up late. Gave lecture at the University today. A very attentive audience although the talk was over-long because of the very slow projection of slides. Our slides (large size) are unlike any used apparently, in either Europe or other countries following

This produces in projection for lectures.

~~March 3 Block mail at Amer. Exp.~~

March 3 Mrs Plemmons picked us up at the hotel about 9. -- went to the Gold Fields building to Dr DeKocks office. This is a fine building, very impressively and expensively appointed. Dr. DeKock had invited us after my lecture yesterday to call over the general features of the Witwatersrand sequence, lithology & in particular the intimate association of gold & carbon in the Carbon Leader and other carbonaceous "facies" of the Witwatersrand system

Pretoria system rocks above, not ~~exposed~~ present on the Rand.


Transvaal System – Dolomites
N.
Upper Witwatersrand
Vereenigingen
Vereenigingen
Vereenigingen

The close association of fine particulate gold in the carbon leader (This is a very pure organic layer varying from films to 3+ inches) cannot be explained except by precipitation from solution (perhaps $Fe_2(SO_4)_3$ solution of gold reduced further by carbonaceous matter to metallic gold. This would seem to imply organic compounds still present in the environment which were highly active in electron transfer - hence perhaps of relatively "recent" biogenic origin)

This concept would imply active biological processes - algal growth etc contemporaneous with the gold ppt'n in Wit water time. Some gold is presumably purely clastic & deposited as a part of the conglomerate coarse to fine sediment (quartz pebbles etc) Some, very minor portion of the gold especially larger amygdaloidal masses might have been introduced by local & limited high temp waters. But much if not most of the gold is directly & intimately associated with the carbon films & "flecks". These "flecks" are commonly microscopic warty objects of discrete form and size.

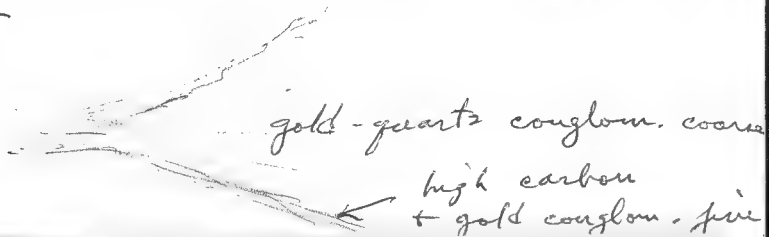
This afternoon uncovered rocks at the geol. Dept receiving & shipping room. Arranged trip itinerary & started arrangements for

trip to Cape Town. Complicated if plan to go via Zambezi Falls

March 4. Cape Town. Landed here at 10:10 PM on 7 PM flight fr Jhb. Flight in darkness from Jhb. Very damp + cool here — change from the dry air of the Rand. Long ride into town from airport. Arrived at SAA town terminal and were informed by agent, without identification by name to go to the close-by Talbagh Hotel - SAA supposedly had wired for rooms. The Talbagh had no record of us, were full up and after prolonged maneuvering finally located a room at the Glendower Hotel. Got cab. Cab out of gas - had to take another cab - over 4 or 5 miles to Glendower — fare R1.65. Finally got room about 12:45 AM.

Spent this afternoon at Geol Dept. U. packed rocks for shipment. Had long talk with Drs Mendelson and Pretorius regarding the association of gold + carbonaceous matter in the Rand and other gold fields of So Africa. They are both convinced that most of the gold here came from solution and was precipitated by influence of organic matter probably in close or direct association with algal growths. Visualize alluvial fans with coarse conglomerates in central parts,

quieter lagoonal waters at margins with abundant algal growth. The highest concentrations of gold are marginal on these fans where carbon is now most abundant




Witwatersrand gold

in 2nd emplacement. No evidence whatsoever that the granites had any bearing on the gold enrichment. This jibes with what Dr. Gribnitz had to say in Barberton — the only gold in the Cob Valley granite is in local zones where

greater lagoonal waters at margins with abundant algal growth. The highest concentrations of gold are marginal on these fans where carbon is now most abundant

Environmental conditions would seem to necessitate an anoxic atmosphere with gold carrying solutions near surface and in reduced state.

If the above concepts are true it follows that the bulk of the gold in the Witwatersrand is essentially biogenically induced as far as the immediate presence is concerned. Hydrothermal concentration would take place by 2nd resolution and ppt'n in altered zones of limited extent - hence hydrothermal action of limited extent would result in 2nd emplacement. No evidence whatsoever that the granites had any bearing on the gold enrichment. This jibes with what D. Gibbitz had to say in Barberton - the only gold in the Cobb Valley granite is in local zones where

the granite had caught up Swaziland rocks and redistributed the gold locally around the metamorphosed initially gold-bearing sediments.

March 5 Friday — Cape Town.

March 6 Saturday 7 AM — This written at the Sir Alfred Hotel of the Castle Line chain in Simon's Town on the Cape Peninsula about 20 miles south of Cape Town. This is a very pleasant town with a winding front street on water front + a tangle of houses + streets spread across the steep hills behind. Quite unlike any town yet seen in SAR — more like a waterfront town in Europe, but the setting so entirely different. At this hour the sky is leaden with heavy gray clouds with sky showing through between. Across the bay are mountains nearly hidden in mist + clouds. Very much like memories of the coast of Peru + Ecuador — even to the faint mist barely detectable in the air. This is clearly a very old town and the hotel one of the oldest buildings here (1831).

Simon's Town — one of the oldest on the Cape + in the country. Proprietor — Mr A. Williams

Yesterday up at 7:30 — called [illegible]

rental car early & got off on trip around the Cape by 10:30. Stopped at Kirstenbosch Gardens for several hours. This is a beautiful spot snuggled under the end of Table Mountain somewhat inland and protected to the SE. Stopped at the Mettelmans home — they served up a fine lunch — Talked until nearly 3 & started out over this remarkably park-like strip of land that terminates in Cape Point which is just SE of the point of rocks known geographically as the Cape of Good Hope. The whole strip of land is mountainous — sediments piled over a curious granite base which shows conspicuously from Hook Bay & south from there to Chapman Peak. Reached the end of the Cape shortly before 7 PM after stopping every few miles along the way down. Actual distance probably not more 35 miles or 40 miles from Capetown.

Vegetation is remarkable for a number of reasons — vivid green except where rocky outcrops show, many shrubs — Ericaceae primarily ? in flower, plant cover dense, tufted & profusely branched. Only in protected areas are trees of any appreciable height — almost the aspect of the timber line on mountains — height of vegetation must be controlled by wind & possibly also by salt from the constant

fine salt mist. Plants are xerophytic in aspect - great numbers of succulents and coriaceous leafed shrubs. Color is unusual now, I am told, but still is conspicuous especially close to Cape where brilliant red lilies are vivid in the low scrub. At top of cape is a 30 sq. mile wild life refuge. Animals - babboons & antelope. Didn't see any

Topography of the Cape is spectacular - steep cliffed shore line, highly indented here & there by sandy (dunes in places) breaks. Mountains up to several thousand feet. Surf on the Atlantic side heavy - beautiful white sand beaches separated by areas of granite blocked shore line. Water temperature warm (70°-75° ?). Giant kelps are abundant & conspicuous off shore. Among the rocks kelp are strewn everywhere - appears like masses of twisted & bent pipes - dark brown. The kelp apparently support a huge population of largish black beetles which feed on the stranded plants.

Now 7:40 & the clouds are breaking up but still quite heavy. Later - 10 AM. light rain & heavy overcast. Seems we were very lucky yesterday with the weather.

Later - clouds continued to thicken and

general drizzle began about 10:30 AM after a few spurts of rain. Became a genuine rain when we checked out about 11:15. Followed the main road to Cape Town. Much traffic & commuter traffic via bus — Saturday noon release from stores. This country seems to shut down at noon on Saturday.

North of Vishoek is a more or less continuous extension of Cape Town city. Lunch at the Harbor Café' [ recommended by Mr Williams as the best [+ only] sea food restaurant in Cape Town. The restaurant is right by the tug boat pool — very picturesque + also very expensive. R 4.10 for a crayfish "lunch" — no drinks — no liccence. Turned in the car — Avis in Mini Minor — for a very reasonable rate — R 14.70 — since yesterday A.M. — and free ride to SAA depot.

Plane left on schedule. Over arid to semi-arid and near desert land to Kimberly. Erosional remnants of the Karoo system are more diagrammatic than any region features I've seen in the U.S. Paleozoic (& Mesozoic?) The stark & totally uninhabited areas of this country are difficult to comprehend by our standards & judgement. — From the altitude of flight (17,000 above sea level) it is possible to look over thousands of square miles where there is no vestige of a road —

Even in the most remote areas of our south west deserts there is no such even remote approach to this in terms of human engagement with the environment. I really believe that there are literally thousands of sq. mi. of So. Afr. which have been barely seen, not only by the Native, but the settlers as well — or is this right — too much is barren.

Set down in Kimberley. Hot & dry — the bloody sun set over a featureless horizon to the west. Only connection between earth and sky was the cirrhus haze & clouds. Saw the diamond grubbers hole — one water filled, the other apparently still active. Why? the interest in diamonds except for some contributory use in technology and scientific advance.

VG

March 9 Johannesburg — 6:45 AM

This is the first opportunity to set down any notes since coming back from Cape Town. On Sunday — the 7th — Mrs Plumstead came to hotel at 10 AM. Drove out to see exposures of Dwyka tillite near Vereeniging on the banks of the Vaal & also a large gravel pit not far from town. The tillite overlies the Transvaal dolomites & has much of the latter incorporated in it — bat boulders & chert blocks

etc. It is not possible that this can be other than a tillite. Next stop for lunch + then to the clay pits near Vereeniger. Here excavated slabs of the fissile, fragile buff to reddish brown clays (silts more aptly) containing leaf imprints by the thousands per foot of Gangamopteris, Glossopteris, Noeggerathiopsis, Gondwanidium (v. rarely) and an occassional stem (compression?) The preservation is peculiar in that the leaves etc seem to be more like casts than merely imprints, although there is occassionally a thin partial film of organic matter - probably cuticle. This bed is low in the sequence - probably among the lower [illegible] stratigraphically belo[illegible] to Jhb after darl[illegible]5.

Up at [illegible]. Dr Truter staff geolo[illegible] Gold Mining Co arrived at hotel at 7:30. (W. Dreifontaine G M. Co is the largest company of the Gold Fields group). He proved to be very informative and extraordinarily versed in the geology, stratigraphy, tectonics etc of the Witwatersrand. Arrived at the mine office at 9 AM - about 40 mi. W of Jhb. There at the office met the Manager (asst manager?) Mr Allen Pohl + several other officials. We were given a very cordial welcome + made to feel

Coryndon Museum
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Bell Punch Co., London, Eng.

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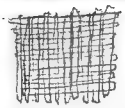
Up at 6 AM on Monday (8th). Dr Trueter staff geologist of the West Dreifontaine Gold Mining Co arrived at hotel at 7:30, (W. Dreifontaine G M. Co is the largest company of the Gold Fields group). He proved to be very informative and extraordinarily versed in the geology, stratigraphy, tectonics etc of the w:twatersrand. Arrived at the mine office at 9 AM - about 40 mi. W of Jhb. There at the office met the Manager (asst manager?) Mr Allen Pohl + several other officials. We were given a very cordial welcome + made to feel

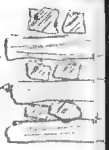
fully at ease. Changed to mine clothes after some discussion of course of visit underground. Picked up lamps at supply house next to Shaft #5 and by 10 o'clock were 4300 ft underground. The lift made the descent non stop to level 18 in a few minutes. First impression is of the cleanliness + orderliness of the mine - This is a really impressive + sophisticated mining operation. Proceeded along contact of the Ventersdorp lavas + the upper Witwatersrand beds — the "Ventersdorp Contact Reef". The gold here is low in concentration and largely confined to a few inches of quartz conglomerate near the contact.

One interesting feature of the mine is the support for the roof made by the lavish use of cross-stacked piles of Eucalyptus logs. The individual logs are 4 — 6 inches in diameter, partially squared + stacked in tight square pillars from a few feet up to 6 feet or more. This apparently makes a very effective crush resisting support. Also used are plain uprights + the usual cross timbers. Roof bolts are plentiful, and a curious cable mesh bolt combination on the side walls of the larger portals near the shaft. The whole mine is tracked + ore cars of 4 ton cap-

as seen from above → ± 4 ft ↑ ↓



← Cross stacked Eucalyptus logs for mine pillars



acity used. The mine produces 280 – 300 thousand tons of ore per month of average gold %. 3/4 % – 1 %.

Temperature above 80° + quite hot because of the very high humidity at this level. Owing to very effective ventilation this discomfort is largely confined to the stopes where air circulation is minimal.

From level 18 at 4300 ft descended another 3000 ft to level 28 at 7300 ft. Here the temperature is noticeably high, the walls of the mine warm to the hand and the humidity very high. Proceeded for about a mile along a main entry – through a massive water safety lock (this mine pumps 28 million gallons per day) + up to the face of the entry + stopes into the Carbon Leader. Spent about 20 minutes here by which time all clothing was fully saturated with perspiration. Temp. near 90° F and rel. humidity 93%. This is near the limit of tolerance to the unacclimatized! Collected excellent fresh samples of the Carbon Leader. Thin as it is this horizon produces 90% or more of the gold from this mine. The carbon is very sharply delimited from the quartzite below + grades up into a fine quartz pebble conglomerate, the smaller pebbles of which are embedded in the carbon (thucolite ?)

The dip here is about the same as the rest of the Witwatersrand system - 30° - we collected from along the strike, looking toward the dip. The adit or entry follows the ~~dip~~ strike + the stopeing is along the dip.

From here back to shaft + up to 18 level again to observe the massive cobble conglomerates of the Bird Reef - This is not commercial as a gold horizon. Had lunch, after cleaning up, as guests of the Mine Co. Our samples had been left below ground + it took over an hour to locate the Bantu boy who had them in hand. Picked them up at the shaft about 4 PM. This delay gave opportunity to see the mining operation + plant above ground. The mine compounds here (as seen from the head-gear) cover a huge area. About 15 000 Bantu work the mine + about 5000 whites are employed.

On way back to Jhb stopped to collect core samples at a drilling station. Watched the drill rig working at the level of ca. 8500 ft. Back to Jhb at about 6:45.

Weather today very cool in AM, warm + very dry + pleasant in afternoon + very cool after sundown.

March 9 Changed itinerary at Abtalia office on Loveday St. Took nearly two hours. Off on field trip with Mrs P & George Hart after 12:30. Collected algal structures & oölitic cherts in upper Transvaal dolomites northwest of Joh'b about 20 - 30 miles. These "dolomites" are essentially secondarily silicified carbonate rocks, often with a skin or thin layer of chert overlying or interbedded in the stromatolitic massive carbonate. Abundant Collenia structure. Some good black cherts, but largely re-crystallized. Excellent gross algal structure. Some curious problematical inverted cone-like structures in the chert bands . Returned to town about 5:30. Weather very cool & overcast until late afternoon. No rain - have seen no rain here in Joh'b area since the 1st week of arrival.

March 10 Wednesday (Arrived So Af. 3 wks ago)

Packed rocks after lunch - 14 boxes with total weight of 273 lbs. Finished packing about 7 PM. Mr - Fockema (banded iron stone problem) helped & drove us back to hotel.

Weather sunny, cool & pleasant

March 11 Thursday

Took train to Pretoria (took 1 hour 30 min!)

[ after three weeks here we still do not know what a Johannesburg "Monkey Gland Steak" is - served in all the restaurants. ]

and went directly to Dr Grobelaars office He + the others at the University were most cordial. Mr - Robbertse was most obliging. Had a tour of the University + the city before dinner. Called on Mrs van der Schijff in the evening. 10:05 train (last train of day) back to Jobb. Met. ~~Prof.~~ Dr. (Lecturer) Pirk Visser of Geology Dept. Mr Robbertse offered a number of excellent specimens of slabs of Glossopteris shale which we took along. These are black compressions on a gray shale - abundant leaves.

March 12 Our last full day in Johannesburg. A hectic day - Nieseem - Mrs P. - Thursday bags - specimens - photographs etc. Finally got out of Geology with Hart's help at 5:30. This is a ~~[illegible]~~ nerve concrete department if there ever was one - or is it. ~~[illegible]~~ a long standing controversy between Univ of Wit Rand and Pretoria - seems more likely a local ~~[illegible]~~ friction. Saw no sign of the reverse in Pretoria.

March 13 (Sat.) Left Johbg at 11:15 SAA to Bulawayo Weather excellent, flying fine 1 hr 50 min. Bulawayo is a fine clean modern city with wide streets and many new buildings Rented a car & got under way late in the afternoon. Drove south to the Matopas Hills area - The rest camps here were full (school holiday week-end) so continued on to a roadside Hotel-Motel - the Hermits Peak Hotel. A quaint place with very nice accommodations in stone + thatched roof buildings Sat + talked African politics for several hours with the proprietor Mr George Lowe

The Matopas Hills area is a highly picturesque region of some 30 x 60 miles, trending NE - SW, of granite intrusives - aspect is one of a very ancient weathering surface. Great blocks of granite tumbled in wild disorder over the landscape. Vegetation is park forest - savanna, some areas fairly well forest covered - trees up to 50 - 60 feet. Even on the rough granite tree cover is surprisingly dense as seen from a distance - trees grow in the most incredible crocks + fissures in the blocky granite. This granite is heavily jointed for the most part + weathering has produced a pro-

[Elevation of the Matopos Hills area ± 4500']

fusion of giant rounded blocks + perched boulders. Blocks often 40-50 + in height often isolated when smaller + standing free on sandy soil or next adjacent blocks. The granite shows some residual gneissic + sedimentary structure - also occasional included boulders - gray to light buff + pinkish in color - mostly gray.

March 14 [weather clear to very light clds. Pleasant]
Sunday Mr Lowe took us on a visit over his land this AM - Bushman painting locality - on overhanging granite face - reddish - brown buff paintings of animals + human forms. The human forms mostly pencil thin - sometimes showing details of hair + fingers - occasionally the sex (This latter is said to be rare among the Bushmen cave paintings.

The granite beds here often show a curious pattern of light streaks, often interrupted, but curvilinear - apparently these represent lightening strikes. Through the game reserve saw only impalas and two ostriches. Arrived at the Malema rest camp about 5:30. Excellent "hut" accommodations. This "hut" is a massive circular structure, granite block perfectly curved wall up to 4 feet, then finished plastered wall, inside + out up to about 10' then a steeply pitched thatched roof (grass

steam thatch about 4-5" thick mat. Cooked dinner on fireplace outside. The camp supplies cooking refrigerator (oil) utensils, bedding, running water & toilets, but no towels or china & silverware. Also supplies a gasoline lantern. This camp has 20 huts, we are the only persons here tonight - last night it was full up!

March 16 Tuesday → written on train Bulawayo - Vic Falls

Yesterday up at 5:30 - nearly full daylight - weather perfect. Clear & no clouds. Left camp about 8:30 - just stop at Nsatugi cave. A short climb - same type of bubble-like semi circular cave with conspicuous central suture. This cave like Bambata is on the flanks of a huge granite dome

in the the metasediments above the domed enthomae. The whole structure of these caves seems best explained by gas bubble phenomena in the granite while it was semi plastic rather than the phenomenon locally designated as "negative internal spalling". No evidence of internal solution cavities. The whole structure is remarkably smooth - hence the quality of the Bushman paintings whose color shows clearly on the grey granite walls. The most striking of these caves is the P. — cave - the last one seen before joining the main road on to Bulawayo. Enroute took side road to left to see the grave of

[Bulawayo means "The Place of Slaughter" — Rhodes made peace here with the Matabele from Cecil John Rhodes - A remarkably simple grave of a few slabs of granite topped by a brass (weathered blue-green) plate with the words - "Here lie the Remains of Cecil John Rhodes". No dates on plate. The only background is the giant granite dome in which the grave is incised, the boulders next to it on all sides and the glorious Matopos granite hills on all sides and to the horizon. This is a tomb of the utmost simplicity and yet more lasting than man could ever desire — so much greater than the mad demoniac efforts of the Pharaohs of Egypt.

— The train has stopped and it is now possible to write a somewhat readable scrawl. —

In afternoon went north to the Hunter-man Quarry Locality - ca 3/4 mile NE of the Turk Mine (gold) Sampled the lithology mostly on the dump. Also in quarry. Quarry quite full - 30-40 ft of water. Limestone bedding still evident. Some breccated black cherts. Stayed until near dark & returned to Bulawayo by 8:30. Stayed at Grays Inn. Good, but not cheap.]

Called Dr Bond in Salisbury — no success. Took off to Highlands Dams

# Japanese Steel Mills To Buy Additional Ore Of Australian Project

## Agreement Raises Total Orders To $1.2 Billion of Iron Ore From Still-Unfinished Facility

*By a* WALL STREET JOURNAL *Staff Reporter*

NEW YORK—Japanese steel mills have agreed to purchase an additional 37.5 million long tons of high-grade iron ore—valued at about $300 million—from the five companies participating in the Mt. Newman project in western Australia.

The agreement raised the total of such Japanese orders to 146 million long tons, with a total value of about $1.2 billion. In addition to ore sales to Japan, the five companies have sold 70 million long tons of ore from Mt. Newman to Broken Hill Proprietary Co., one of the five partners in the enterprise and Australia's largest industrial concern.

This brings to 216 million long tons the amount of Mt. Newman iron ore sold in advance of project completion. A long ton is the equivalent of 2,240 pounds.

Industry sources said this is the biggest pileup of orders for any kind of mine anyplace in the world prior to the beginning of operations, and that most probably it's the biggest backlog of orders in the world even for a mine already in operation.

Partners in the Mt. Newman project are Amax Iron Ore Corp., a subsidiary of American Metal Climax Inc., which holds a 25% interest; Pilbara Iron Ltd., a subsidiary of the Australian concern Colonial Sugar Refining Co., which has a 30% interest; Dampier Mining Co., a subsidiary of Broken Hill Proprietary, which also has a 30% interest; Seltrust Iron Ore Ltd., a subsidiary of the British concern Selection Trust Ltd., which has a 5% interest; and Mitsui-C. Itoh Iron Pty. Ltd., which is 70% owned by Mitsui & Co. and 30% by C. Itoh & Co. Mitsui-C. Itoh's interest in the Mt. Newman project is 10%.

According to Amax Mineral Sales Corp., an American Metal Climax subsidiary responsible for developing markets for the Mt. Newman ore outside Australia, the new agreement with the Japanese mills calls for delivery of the 37.5 million long tons over a 10-year period beginning in 1971.

The sale is subject to export approval by the Australian government.

American Metal Climax said Mt. Newman iron ore would be produced at a rate of about 16 million long tons annually by 1975 to meet the Japanese and Australian contracts.

It would take a train 1,150 miles long—or more than the distance between New York and New Orleans—to handle this annual output in a single haul.

Three years ago it was announced that an estimated $150 million would be invested in the open-pit mine, crushing and screening facilities, a 265-mile railroad from Mt. Newman in the interior to Cooke Point at Port Hedland on the northeast coast of Australia, and the building of a modern port and loading facilities.

Yesterday's American Metal Climax announcement added that these facilities would require "considerable expansion" in order to meet the new ore commitments. The harbor at Port Hedland will be enlarged to accommodate ore carriers of 100,000 tons, initially the harbor had been planned for ships of up to 68,000 tons. Cost of the expansion wasn't revealed.

Mt. Newman is believed to be one of the largest high-grade iron ore bodies in the world, with an estimated average grade of ore of 64% iron. The first contracts, calling for delivery of 100 million long tons of ore to Japan over a 15-year period beginning next year, were signed three years ago. And last July, Japanese steelmakers agreed to buy an additional 8.5 million long tons of ore.

...es - the railroad first reached Bulawayo in 1897 -

for lunch - a delightful spot - spent over two hours there. Dinner at the Peking Restaurant again - excellent Chinese food. Aboard train at 7:20 en route to the Falls.

This written some distance NW of Bulawayo but difficult to write because of movement of train - Outside a beautiful moonlit night - past millions of trees of the park - forest of central Africa. This is a very beautiful and wonderful part of the world - how may I record it in my memory. It is so unlike any memory I have of Central & So. America. It is probably unique to Africa.

The train is bumping too much to write any more. Finally a stop to take on a passenger - or perhaps to make it possible to write a note which is legible in this record of travel for a journal which is written only on the

The train comes to stop all around us is the African Veldt under a full moon. There are trees spaced on the horizon in the tall grass. above all is a silver light - train moves again not possible to write.

March 17 Train pulled in to Victoria
Wednesday Falls Sta. promptly at 8 AM.
Took cab to So. Rhod. exit to
Zambia, where we were quickly convinced
by a gentleman of the Rhodesian customs
to go to the So. Rhod rest camp near
falls not the Zambia. A wise direction because it pro-
vided cheap (1 L 3 d for 2) lodging
and facilities. Had large 2 bed "hut"
with fire + water provided by African
help. Spent several hours wandering
along south edge of falls. The falls
were perhaps 3/4 capacity or less owing to
the extraordinarily low rainfall this rainy
season. The whole Zambesi River is held
up here by a basalt - diabase complex
of very fine grained resistant rock + makes
a precipitous plunge, although in my
estimation it is not as spectacular as
the Niagara falls - largely because of the
bed rock control - i.e. diabase vs lime-
stone in actual modelling the plunge
of the water - perhaps in a full river
stage this would not be true. The whole
area on the South side is well cared for -
with roads + trails, signs etc, but al-
most no visitors to be seen - ex-
cept a few wanderers from the luxury
hotel at Vic Falls Station - most of

collected Nostoc? colonies at Danger Point - These growing on the diabase, semi attached in the heavy rain spewed up from the falls

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Them provided with rain coats. The delimited rain forest area is remarkably restricted to the splash area near the falls Would estimate the upPurent of liquid drops of splash water here to be several hundred feet - total drop of water probably augmented by some re-condensation. The rain falls fairly vertically in heavy showers at the whimsy of the wind. One can be thoroughly soaked in a few minutes in bright (and much appreciated) sunshine The water temp is warm, but rapid evaporation is surprisingly chilling.

March 18 Left camp hurriedly after a late
Thursday trek to the falls in late morning.
Walk to finally find the Big Tree took far more than estimate. Back to living about 2 PM. Livingstone and the adjacent but limited area of the Zambia countryside seemed similar to the Rhodesian but much less active re human activity - also almost no whites seen. At airport however, all key personnel were European not African. Plane a UC 4 prop to Salisbury via Kariba. Flew over a large sector of the lake and the pilot

circled the dam twice. A magnificent view of the dam & Zambezi gorge below the dam. [one of a group of American tourists on the plane commented to her husband that "That was not much of a dam". To which the reply "well it is probably good enough for those people"]
The dam is over 400' in height and impounds the largest artificial lake in the world presently — 160,000,000,000 — of water. Suspension of this load of water has depressed the crust about 7 feet in the local area (Karoo rocks — in an inter-shield-area basin)
Karibe airport was quite warm & humid. Vegetation in area fairly heavy forest cover & whole countryside quite lush green.

Much apparently uninhabited country between Karibe and Salisbury - in fact appears to be totally uninhabited from the height of the plane - but the altitude & the cloud cover give a quite poor impression or assay of the ground cover & terrain.

Landed at Salisbury about 6 PM

Cost of excellent cigarettes here is Shillings 1 + 3d
= approx. ±19 ¢ per pack of 20

March 19 At Norfolk Hotel in Salisbury
Friday Spent AM in town - collected mail
at Overland Tours (agents for Amer.
Express] Haircut (4 shillings 6 d) etc etc
+ airline reservations took most of the morning. Professor
G. Bond, Geology, ~~Univ College~~ Univ
College of Rhodesia, came at 2:20 to the
hotel + picked us up. I had contacted him
in the AM. He is a very friendly and charming
person and made us feel at home and at
ease. This University College is only 8 years
old - is rapidly expanding in buildings
and enrollment (now 850 students) The
Geology Dept is 5 yrs old - there new
+ fine building 2 yrs old. The curriculum
in sciences provides a 3 yr course
with one additional year for the better
qualified. I came away with the feeling
that this raw new school was an earnest
beginning + sincere attempt to create something of
growing importance to what is clearly one
of the more embryonic countries of high
potential in southern Africa. The political
future of this will be interesting to watch.
- What would happen to this venture if
So Rhodesia is nationalized - ie. indepen-
dent -

Dr Bond dropped us at Hotel + after

at Salisbury Hotel - Mr Faulkner & Prof. & Anthropology at Univ of Nairobi - known Prof Tinkell of Oxford Univ.

a quick dessert got to airport about 8 PM. Had time, although brief to call Mr Tracy. The man I reached is the grandfather of Liza Tracy, whose father had just today gone on business to Cape Town. This elderly Mr Tracy (phone listing is "Bovey Tracy") was very cordial and appreciative of the call. Sons name is Clinton T. Tracy - he is among the ~~the~~ prominent agricultural leaders in So Rhod.

Plane a VC-10 enroute Johnby to London - via Salisbury, Nairobi & Rome. A mountain plane probably some larger than the DC 8 B or Boeing 707, but completely full. Only a very few passengers (probably 8) took off at Nairobi. Left Nairobi airport about 1:30 AM local time (one hour later than Salisbury time). Lodging at the Salisbury Hotel in Nairobi. Weather at landing 62°F & pt cldy. To bed at 2:45 AM.

Monday — Up at 8:15. Bkfst here at Hotel. In town at 11 AM. Rented ~~car~~ car at Habibs Car Hire ~~+~~ after several hours of errands in town left for the Mt Kenya Road about 2 PM.

* What is Kenyatta College - about 10-15 mi. N of Nairobi. Admission is restricted?

On a Saturday noon hour it is utterly incredible to account for the frequency of automobiles in a city of this size. The magnitude of the parking problem + general congestion is comparable to that in the U.S. The reason for this is not easy to see. There just are not that many endemic sources of wealth to support this proliferation of motor vehicles.

North on road to Mt Kenya - Through or around Thika, Fort Hunt and on to Nyeri - The latter a nice small city - well in the uplands + very (too cool) cool. Took road to Nanturi for some miles + turned back about 5:30. Mt Kenyan slopes were visible but the rest shrouded in clouds + Thunderheads.

The most pointed memory of this trip north is that of the hundreds, if not thousands of human pack animals - nearly all female, except occasional old male (never young, except girls) carrying an extraordinary variety of pack-back loads. Usually faggot bundles or straw bundles (for thatching), often large sisal bags of food, wood, cans or other staples. The main support is on the forehead or shoulders - The

individual carrying on hill slopes (i.e along road or gentle field slope) is often inclined at an angle of pelvis to back of legs of 65 - 95° or more. They make a caricature of the human form. load → head, Much of the heavy loads are plain wood. The women always take the loads; the males carry fresh knives or sticks - clubs (small) Young females of adolescent age are never seen - nor are young males on these roadside human caravans. Occasionally see a young male - age 10 - 14 carrying a head bundle but general few head bundles are carried - most of the weight seems to be supported by the backward pressure on the forehead or shoulders designated by the backbone and pelvis. It is a truly remarkable sight to see the human animal perform as a beast of burden, often carrying loads which one would judge unusual or even excessive in terms of animal carrying capacity.

Returned to Nairobi about 9:20 after having been lost in the "suburbs" for a short while. Had dinner at the "Pagoda Restaurant" - a new Chinese

establishment. Food good, price reasonable.

March 23. Peredinija, Ceylon.

It is difficult to write any objective narrative of events during the period since the last entry if only because of the confusion put upon one by attempting to understand this strange Island of Ceylon. But to the narrative: Checked in the rental car at 12:30. Had lunch in town and returned to Salisbury Hotel in time to get to Swimming Pool about 2:30 Left for airport via the bus at New Stanley at 5:30. Plane to Bombay (Air India) at 8 PM. Were weighed in at 9 kilos excess wt (approx. ($ 30.00 =) After a sequence of events involving removal of excess papers, equipment etc for hand transport on plane reduced this to 2 kilos. Was advised one, this was not enough to charge excess weight for, and 2, that we could repack and forget about the excess as long as the agent was exonerated - i.e. was ignorant of knowledge! Left on time 8:50 PM - Airport swarming with Indians Weather clear. Came down at Aden - hot + humid. Dirty little airport. Left after half hour. Landed Bombay about 5:30 AM local time. Not get light. Offer a complex tour of the airport (transient section) escorted by an Indian BOAC official

had breakfast (expense of Air India) and after a several hour wait took off for Colombo about 8 AM. Across western India (an extraordinary alternation of arid - semi-arid land - rugged mountains + extraordinary pattern of land usage etched into the denigrated areas of the lowlands. Crossed out to sea at the tip of India near the mouth of a large but completely dry river. Started down to Ceylon on schedule - landed at the small and shabby air port about 20 miles north of Colombo. This area is completely covered with countless numbers of coconut palms, planted in regular rows. Road in to Colombo seemed endless - through miles + miles of low-lying swampy land covered with shacks + hovels (mostly squatters I later learned - all south Indians). Colombo is a curiously discouraged and shabby looking city. Poverty is everywhere so evident as also the swarms + swarms of people, made the more conspicuous by their showy native garb. Continued on in bus to the "fashionable" area and got off at the Galle Face Hotel. This turned out to be the greatest mistake of the trip since, owing to the fantastically unfair and

~~Talawakelle~~ Labookellie Tea Factory, Labookellie estates - on road to ~~Nuwara Eliya~~ Newara Eliya

unbalanced "official" exchange rate (£1 = Rupees 4.75) it proved to be far the most expensive hotel & board of the whole journey thus far. - room and three meals 77 rupees - ca £28, The hotel is a holdover from the days of empire now somewhat run down but still quite grandiose, and also huge. Our "suite" included a drawing room, bedroom and bathroom - all large. Lunch & dinner were Rs 9 ea. Too tired to worry about it too much. Made arrangement for car (driver has to be included at Rs 7 per day) for 300 miles for 342 rupees. - 4 days. [Arnolda Tours]

By curious circumstance the day of our arrival was election day in Ceylon. It became apparent by late evening that the pro-leftist government of Mrs Bandaranaike was losing control to the United pro-western party. Apparently the approaching bankruptcy and increasing economic chaos has caused some consideration of a course of common sense. If one knew his way around here he could exchange dollars for 2 to 3 times the so-called exchange rate which is out of all proportion with the true value of the

dollar or pound sterling. In Ceylon the past years labor costs have skyrocketed, the exports of food vastly increased and the balance of foreign credit almost vanished. Imports have greatly exceeded exports and the major import item is food — Ceylon is a highly fertile tropical island. The population (ca 11 million) has burgeoned and appears to be heading upward at an alarming rate.

Left Colombo Tuesday AM and proceeded slowly toward Kandy. Arrived at the Peradiniya Bot. Garden in mid-afternoon & met Dr Jayaweera, director, whom I had met in Cambridge several years ago. He & his wife were very cordial and we were invited to dinner and made plans for drive up to the height of land near ~~Hotel~~ Nuwara Eliya tomorrow. Dinner was excellent — wild boar meat for main course (I thought it quite tough) preceded by generous highballs and topped off with dessert & mangosteens.

Left about 8 AM for the 50 mile drive to Nuwara Eliya and the highland botanic garden of Hakgala. On the way up the slopes covered with the fine flush tea plantations. The true

[Name of car driver, Colombo = Mr Marshal Wijeyasooriya address c/o Bobby Arnolda, P.O. Box 926, Colombo Ceylon]

beauty of this tropical island became apparent. Despite the poverty of its people this is an land of lush rich beauty. The pattern of tea plantations is remarkable backed by the distant mountains. Entire landscape a vivid green under a blue sky and hot sun. On way up at the 5200 ft level stopped for a tour of the Labookellie Tea Factory. The entire sequence from the fresh pick of the tea pluckers (all women - Indians) to the wilting stage → rolling → fermentation → drying → seiving + sorting.

wilting takes 15 - 18 hours, rolling follows on big machines which break the tissue + compact it. Fermentation is controlled in piles of 4 - 6 ft × 3 ft × about 4" deep. - up to 90°F. This is an enzymatic, not microbiological process. Drying is at 120 - 125°F. Four grades - 1) twigs (coarse tea - preferred by Egyptians + Arabs) 2) Orange Pekoe 3) Broken orange pekoe 4) dust Not a bit of tea is lost - all loose fragments are swept up and put into the processing by assiduous workers with brooms and nimble fingers.

The Hakgala highland garden was well

Present cost of a tuskless elephant in Ceylon 10,000 rupees - tusked elephant 15,000 rupees

worth the extra drive. Tree ferns thrive at this elevation - 6200 ft. The temperature extremes recorded here are 82.8° F and 34° F (the latter record set ~~last~~ this year - the previous record was 38.2° F Rainfall here is 95 inches/year, chiefly during the SW monsoon.

Arrived back at Peradiniya about 5:20 PM

March 25

Thursday Worked at correspondence + NAS-NRC most of day, about noon went up to Rest House across the road from the Garden for a few bottles of beer - price quoted was 12 Rupees for 3 bottles with bottles returnable at 50¢ each. That makes the price about 70 - 75 U.S. cents per bottle Declined the pleasure.

Some economic facts of present day Ceylon

Tea pickers (chiefly Indian women) receive pay by lb picked, or if on salary as steady pickers Rs 2.50 - 3.00 per day. All medical expenses paid + housing free.

Cost of rice per lb in market Rs .70, if bought at State stores per measure (2 lbs) = Rs 1.20 per measure.

Meat - good measure free of bones about Rs 1.20, poor cuts Rs .80

2nd grade (dark label) arrack = Rs 8.88,

± 350 spp birds native to Ceylon ?
52 spp snakes - 5 poisonous or dangerous
There are about 3000 elephants in service
and about 2000 wild on the Island of Ceylon

cost of bottle R 1.00
Owing to the ambivalent exchange rate the car rental deal I made came to $ 37.00 for 300 miles plus driver for 4 days The change for $ 50.00 Travelers check came to $ 17.00 which I received in exchange at rate of R 7 per dollar which came to 119 Rupees. The driver was paid out of the $ 37.00 at rate of Rs 7.50 per day. This means that at the "black market rate of 9 R per dollar, he received about 80¢ per day.
Hotel: Sea Breeze Club - bed + ~~lodging~~ board per day = 66 rupees. Bell this AM = ~~66~~ 66.15 rupees. Cab to Galle Face Rs 1.90. Police guards in streets as we went through town. Today the new government is sworn in. Hard to understand why anyone would try to harm a member of the new government after the change from the ~~russ~~ the old government has made. This weeks memories of Ceylon are strange ones in degree of conflict. There is no doubt that the people are a charming, friendly and supremely lazy lot, given to standing around, watching and enjoying life and eating government purchased rice while the Indians do the work and collect the money. The country is bankrupt, lovely and yet hopeless for the visitor with its present Alice-in-Wonderland financial mess. Vast inflation goes poorly when rigid and utterly artificial controls are placed on outside capital - even tourist money is virtually

rebuffed by present controls and get the money is needed desperately. While people are sleeping in rags on the street the country is turning away new capital! How nice to leave this "Pearl of The East" It needs a new oyster!

March 27 Enroute Colombo → Kuala Lumpur.

Saturday Left Colombo (Ceylon Air Force Base Field) about 10:45 local time. Crossed the Island directly over Nuwara Eliya (saw the small lake there to right below) crossed the coast - great expanses of sandy beach on the east side of island. Cloud cover over Indian Ocean negligible except the line of alto ~~cut~~ cumulus + cumulo nimbus to ~~south~~ south. For two hours due east no cloud cover over sea, only broken cumulus wide spaced. To south ~~a~~ more or less continuous grouping of alto cumulus (= intertropical convergence zone?) About 12:45 clouds to southeast very high at intervals - alto cumulus + cirro-~~strates~~ stratus above. Huge cloud build ups while approaching Sumatra. Passed over north tip of Sumatra and turned SW down the Strait of Malacca toward Kuala Lumpur. Landed there on time - a fine modern airport - air-conditioned to boot. Heavy overcast but no rain. Sumatra appears to be a beautiful rich green island, the number of rivers flowing into the sea is quite extraordinary in proportion to the land area. The island must have an exceedingly heavy rainfall, centered chiefly on the highlands to the west. The parts of the Malaysian Peninsula seen between K.L. and Singapore appear similar - intensively cultivated + well watered. Great areas, erratically dis-

trabutted, & open ground where tin ore is being stripped off.

On approach to Singapore Island noticed 8-10 warships of the British Fleet at anchor - 1 or 2 aircraft carriers among them. Landed at Sing. on schedule. This is a fine new airport and a busy one. Put up at Lloyds House hotel - not far from the Prime Ministers home. Had dinner at a busy chinese restaurant, the Kwee kee, on St - not far from the Raffles Hotel. Much too much food for two for under U.S $ 5.00. Walked along harbor front - Queen Elizabeth walks afterward. The city is teeming with people but at least in this large area of it it appears to be dynamic & prosperous. The population by and large is dressed in western style clothing - except for the common chinese garb favored by the chinese women - This is a welcome change from the stuffy drapery of the Indian and Sinhalese clothing - especially the women. Weather clear, almost dead calm. Some flicker of lightning to south. A hint of greenhouse atmosphere, but very pleasant.

Sunday Singapore.
March 28 Dull grey AM. Slept at hotel. Went to Malaysian Airlines to arrange visit to Kuching & if possible to Sibu. Telephoned later from GPO to Kuching re visit to Dr Wilford. Reached his wife & arranged to arrive in Kuching on Monday or Tuesday - later found Hotel - There was no assurance of taking flight to Kuching & return to Singapore with assurance of leaving for Perth. Hence, cancelled the whole plan. It is a pity because so much might have come of the visit.

Lunch at same restaurant as last night - in

Chinese restaurant in Singapore = Skee Kee
4 blocks east of Raffles + one block north

the Chinatown area beyond the Raffles two or three blocks and to the left. Excellent food. Later — purchased several items at China Trading Co. on esplanade of the Raffles Hotel. The Raffles seems quite simple in general layout + offerings in terms of world renowned hotels. Perhaps a different gauge of judgment should be used in terms of present speed of transportation, i.e. the numbers of people + frequency of plane transport to major centers.

Lightening struck the hotel twice in an interval of a few minutes tonight — about 6:30 — near dusk — almost the only thunder ~~heard~~ heard all afternoon.

Sorry to leave Singapore — it is a truly cosmopolitan and pleasant city. No beggars, or night sleepers on the streets. Bussle + hustle, but with a charm and uniqueness.

Left Sing. on schedule, Monday night at 8:45 — 4 hr + 30 minute flight to Perth — non stop. Passed just west of Jakarta, Java — only at ~~an~~ elevation of 38,000 ft above ground.

Landed at Perth at 1:50. Cleared customs and got quarters at King Edward Hotel by 3 AM.

~~Monday~~ Tuesday — Perth, Australia

Sunday April 4 Kalgoorlie

~~Here~~ 2 years of wheat + no rain and you're done

Hotel Oriental - Kalgoorlie

Since arriving in Australia it seems that time has been largely wanted until arrival here. However today met Mr Wm Cleverley, Head

of Geology at Kalgoorlie School of Mines (no appointment in advance to my embarrassment) - and spent a very profitable day going over local mine dumps. Most interesting was the abandoned Queen Margaret mine about a mile west of the ghost town of Bulong - ca 18 miles east of Kalgoorlie. Collected abundant pyrite spherules & some black shales - the latter showing metamorphism - age ± 2400 m.y.

At Perth spent some hours with Dr Edgell on various aspects of Australian Pre-C. He is well versed in the algal stromatolite - Collenia - Conophyton problem in Australian Pre-C. Mr H Trendall was most helpful & interesting re the iron formation problem - Brockman Iron Formation in the Hamersley Range area

Stayed at Hotel King Edward in Perth. Rented a Mini Minor on 5th Apr. 3 & started off to Kalgoorlie - 375 miles. Arrived Kalgoorlie about 9:30 PM. Vegetation quite lush & green Perth to N- Then progressively more arid. Grass trees quite limited to about 40-50 miles from coast. Extraordinary destruction of native vegetation by burning - deliberate burning. No hope of knowing original cover balance ecologically by seeing what is left on this area. Wheat lands extend west to about Southern Cross - Then scrub-land

for another 150 miles to Kalgoorlie – This largely modified by sheep grazing. Mostly dominated the whole 375 miles by a park-like Eucalyptus "forest" in which the density of cover seems largely controlled by the degree of sandiness of the surface soil. Centre area is underlain by Pre C granites & some basin rocks of varying lithology & the whole weathered some hundreds of feet – no young sediments. Region of Kalgoorlie is a unique vegetation to me – seems it should be a "sage brush" vegetation but is actually dominated by bizarre but handsome Eucalypts.

Weather in Perth quite hot all week Tuesday through Friday 80 to 88 °F Cool Friday night & strong wind set in from SW Sat AM. SENT 2 PACKAGES from Kal

Monday April 5 Left Kalgoorlie about 5 PM Overnight at Southern Cross – a distribution & rail town about 230 miles east of Perth. Hotel – Palace Hotel double for 2 L 2/10 per night.

April 6. – Up at 6:30 – early tea. Bkfst at the BP station beyond cross road to east of center of town. Weather clear to pt cldy with quite strong NE wind. The wind the past several cool days has backed SW-S-SE→E→NE.

Left So. Cross about 8 AM. The

grazing ratio here = 1 animal per 40 acres

vegetation scrub → Eucalyptus with sub-scrub. Scrub in sandy areas, Eucalypts in the areas with higher ferruginous true soil areas. A pattern difficult to interpret except in terms of bed rock soil origin which is not evident at surface. First grass trees seen 80 miles east of Perth - none for some 40 or 50 miles further - then abundant until the drop down toward Perth some 15 mi or so east of the city. They are remarkably fire resistant + the charred stumps support a good growth of "leaves" after obviously severe burning of the stems. Collected seeds from a few "trees" about 40 mi. e of Perth along the highway.

Wed April 8, Perth Hotel K Edw

Last night in Perth. Today had visit with Mr -- Lord, Dir. W.A. Geol. Survey. An uninteresting man - polite + pleasant but nearly non-scientific. Down to Freemantle late today - a neat + clean seaport town. Watched the cruise ship Fairsky of Genoa (Italy) berthed Bought kangaroo ring (Boomerang Shop, 8 High St, Freemantle) Specialize in Australian aboriginal items.

Much wood on dock being loaded for ports north + west - dark red heart wood planks = Jerry Jeare? Garrie? - beautiful dense wood. A loading foreman said it was not resistant + immune to termites. Used for construction + boat building. Weather threatening today - heavy

clouds from W & SW but very little rain — not enough to clean off windshield.

Univ of W. Austr student clearly parade today — directly through center of town. Quite a show. The Pictured placards very cleverly done — carrying emphasis on the "Pill" & the churches stands and on the KKK. — all done in elaborate floats & dress. Stopped the whole city on Hay St for over an hour. To Fremantle this Afternoon

Dinner at Canton Restaurant again — have had most of our meals here since arriving in Perth.

Thur April 9. Visited Univ of W Austr. This AM. March he hurried a visit with Prof. B. Balme & others in Geol Dept. Balme drove us back to hotel. Packed & left about noon for airport. Plane left about 2 PM — late. Weather overcast almost all the way to the Great Bight. Considerable "forest" cover visible however for several hundred miles east of Perth Nearing Adelaide about sundown Again an arid area. Adelaide seems a nice looking city. Overnight at Hotel Grosvenor on N Terrace.

Friday. At University of Adelaide most of day. Prof. Alderman took us to lunch with Mary Wade of Dept. Got maps & info about Alice Springs area from Dr — Wopfner of the S. Austr. Geol. Survey.

Elev of Alice Springs ("The Alice") = ca 2000 ft.

Sat 4/11. Left Adelaide for Alice Springs at 11:15. DC-6 4 prop plane. Due north over the desolate waste land of south & central Australia - Came down Alice Springs at 3:30. This is a remarkable surprise in the middle of this arid landscape. The town is a thriving (tourist business) town of ± 4000. The most modern accommodation by far as yet in Australia - at Oasis Motel. Excellent double units - swimming pool etc etc. Quite hot in late afternoon but cooled off remarkably after sunset. Flies worse than in Kalgoorlie. Why isn't there more said about the incredible flies of Australia. They are the large molecules of the Australian atmosphere.

Sunday 4/12 Loafed most of day. Swimming etc

Ross River N.T.

Monday Rented car and started out for Ross River Homestead (Loves Creek H.S. - same) Sand road in places + badly gutted here & there by washes in others. An arid but curiously free dotted landscape - quite rugged, but no mountains in the sense that we designate them - eg. the highest peak in this area - (Heavitree Quartzite) about 3700 ± ft.

Flies everywhere - One could write a Life Nature Library volume about the

Australian flies. Where do they come from? On the most arid plains of this most arid country the flies are here to greet you. They apparently live on sun and sand - these large Australian nuisances. They are the chief obstacle to field work (I have little faith in Australian geology because of the flies - one can't think in the face of them - nor take pictures when the flies are in the camera view-finder.). Oh well - only problems of the field. But a new problem - only matched by black flies in Canada in April & May

Alice Springs N. Terr.

Back in Alice Springs by 4 yesterday afternoon. This is a sorry country and settled by a sorry few. Too bad because the people one meets are among the nicest one could know. Maybe our standards are wrong - or perhaps it is the flies when one tries to write. No wonder so few novels have been written in the sun in Australia

Thursday

April 15 Left for Adelaide on 12:15 plane. Car rental came to £17/9; motel bill £27/-. Weather pt cldy but hot. High yesterday about 94° F. Clear most of the way across the central desert region but considerable dust blowing becoming noticeable somewhat north of Port

Augusta. The dust completely obscured the landscape below. Between Pt Augusta and Adelaide cloud cover thickened and sky very threatening. Began to rain heavily about 4 PM in Adelaide with strong NW to Westerly gusts. Hotels booked up completely in the city - secured quarters at Hotel St Vincent in Glenelg - about 8 mi south + on the shore. Quite pleasant place. Strong gusty wind off the sea, but stopped raining by 6 PM or earlier. Unpleasantly cool after the past 5 days in central Australia.

It appears that the Easter week-end is the big holiday weekend in Australia - apparently more of a holiday for travel etc than Christmas. Also it transpires that Monday after Easter is a full holiday.

Friday April 16 — Took 11:15 Ansett flight to Melbourne. Plane went over 640 mph - tail wind strong (Boeing 727) - flying time 43 minutes to Melbourne! Weather pt cloudy. Country side quite extensively cultivated over much of this area, but nearly all brown except where irrigated. Arrived Melbourne only to discover that Monday is also a full holiday for business as well as govt. D spent over 1½ hours on phone to try to salvage efforts to pick up our 30 rolls of film in Sydney - forwarded to Sydney from here. Transpired that the head of the ~~exist~~ processing dept is in Belgium which did not simplify matters. Her wife, however, was

most cooperative. Stayed overnight at Hotel Federal - an 1890 'ish type old hotel - no bath but sink in room at £4/13 for two nights B&B. Melbourne seems like a piece of Americana of about 40 years ago - architecture, old trams, ways etc. Many buildings are being razed for new structures, however. - will double the rental volume for the owners. The cab driver tells us! Weather cold and very windy - no rain

Sat. 17th. Took plane Melbourne to Sydney at 2 PM. Weather alt very cloudy to sunny and very windy. Flight unusually fast because of over 100 mph tail wind. Mostly cloudy until near Sydney. Decided to rent car as soon as landing & get out of Sydney & to country. Got going from airport at 3:45 in a VW. Went north & visited the Koala sanctuary in Castle Hill. This is a shabby, but well kept commercial venture, but at least there were a few bona fide Australian marsupials - 15 very tame kangaroos in fact. Remarkable animals particularly their locomotion. Started out toward the Blue Mts about 5. Steady stream of cars, chiefly heading east. Very trying driving. Had dinner at Penrith and began Katoomba

began looking for lodging. It turned out to be a laughing matter - absolutely no place available. Turned back at Blacktown and tried 6 places unsuccessfully. Even the police station in Richmond was of no help. Finally returned to Sydney about 2:30 AM after driving over 200 miles. By a lucky cancellation got a room in the Hotel Metro

people in Sidney for the night. Find that there are hundreds of thousands here in Sydney for the Royal Easter Fair, so that the hotel situation here as in the Blue Mts is hopeless (260,000 persons at Fair today). The streets of Sydney at 2:30 had many cars & a startling number of pedestrians.

The almost complete euphoria which afflicts the entire country of Australia for the Easter holiday certainly has no counterpart in the U.S. at any time of year - perhaps the 4th of July comes closest as far as frenzied application to the bottle and rum is concerned. Easter also produces by far the highest highway death rate here.

Saw nothing of the Blue Mts for all the long driving (at 1 shilling/mile) except what was visible by the nearly full moon.

An interesting day to drive over 200 miles, on the left side of the road, between 3:30 PM & 2:30 AM next day on the day of the greatest road congestion during the peak holiday period in Australia in the most densely populated part of the country.

4/18. Left the Hotel Metropole about Easter Sunday noon - no room for us transients. (Also no request bookings for the room we had. The "Booking System" remains a mystery to me. A curious anachronism as judged by our hotel & hotel system of first come, first served and let the chips fall.) Drove out to Parramatta (W. Highway Rd)

and off on Hume Hiway. Found a nice Motel (Metropolitan Motel) within a few 10 Ths mi.s. Double room with bath £45 (+ bfkst)! a boon.

Took train (Metro) in to Sydney Walked Through the Botanical Gardens for several hours. These are very well kept and located in a beautifully placed part of the harbor complex of shorelines — one of the finest physical settings I have seen for a city park - botanical garden complex - also well policed - every one out at sunset.

Sydney is a city in transition. The old Sidney is rapidly being buried beneath the new - the new is the same old type (old, now) complex of aluminum + glass skyscraper-type buildings. All glittery + modern and yet so too - much - the-same I wonder when they will all be torn down to make some thing more individualistic and at least more personal. With present trends all cities (perhaps with the omnipresent help of U.S. capital) will all look alike.

Why not put all the buildings under ground and make the earth more beautiful - Water problems? - only in part

At any rate I would judge that Sydney is going in the wrong direction, architectural than any large city in the world - in the long range architectural trend or change

4/18/65

AMEN to AUSTRALIA. — Thus far after spending three weeks in diverse parts of this continent the following facts cry to be recorded.

1) after driving over 1000 miles in western Australia over both "sealed" and unsealed highways deep in the bush country (east of Kalgoorlie) have seen no (one at great distance) kangaroos

* 2) Have seen 4 EMUS — on road from Kalgoorlie to abandoned mine ? Margaretta 20 mi e. of Kalgoorlie (→ Queen Margaret)

3 Have seen no rabbits, although have seen two traps - continental rabbit proof fences erected at fabulous cost.

4. Have seen no dingos — nor evidence of them anywhere in the country

5. Have seen no koala's, nor heard any interest in them except in tourist shops selling stuffed animals except in the commercial "koala preserve" near Sydney.

6 Have had personal experience in the outback with countless millions

if not billions of flies, euphoniously called blow flies. These goddam flies are the greatest menace to normal functioning of the normal person that have ever been created by Mother Nature.

4/19/65 Metropolitan Motel, Ashfield, Sydney

To the Royal Easter Show today. This is an adventure in time reversal - seems almost like my memories of Coney Island from boyhood years. The midway - the yawkers, the sequs etc. Also the curious motley assemblage of spectators. The animal performances - horses, cattle etc, however were excellent of of top quality, both with respect to animals and to the management of the exhibits, program etc. A most interesting day. Discovered the efficiency of the Sidney transport system again - a quite unusual system of city transport, somewhat reminiscent of the Paris Metro - no push button route maps, however. Weather warm + pleasant until late afternoon when a cool or even cold wind suddenly came in from S.E. Returned to the fair after dinner + were among the last out crowd at 10:30 - Thoroughly chilled.

4/20/65 Hotel Daniell, Brisbane.

In to town fairly early. Very heavy traffic. Went to Austr. Territories Office on - St to get visas. About noon - said they had to call Canberra. Also say they dont ordinarily issue visas - all through Canberra. Contrary to what we had been told + cabled three months ago from N.G. Lunch. Now Canberra so had to wait. Lunch in town. Went to Kodak. No films yet - another holiday in Victoria (Bank holiday, Tuesday after Easter Hence no luck. Stopped in at Esso - Spent

a very interesting hour or so there. Met again Abe Phillips of Humble - last saw him in Chico California, Fine people very helpful + friendly.

Went to Airlines to get seats for New Guinea - Discovered no flights available for three days - two planes tonight, but all full also full on Wed + Thursday. No one knows why all the traffic to N. Guinea - But a feat After some deliberation decided to go via Brisbane (2 nights) Townsville (1 Night) and Cairns to Port Moresby + Lae. Left Sydney about 3:30 PM - arrived Brisbane at 10 PM warm + humid here. Seems a somewhat larger city than Perth, but not similar in appearance at night.

4/21/65 Brisbane. Weather fine - warm + sunny. Rented car. Went to Koala Preserve (Lone Pine Sanctuary) Spent 4 hours there Have fine collection of over 200 koalas and a good assortment of kangaroos, wallabies, some Wombats, a few dingos and many australian birds. A very well run place about 10-12 miles from Brisbane center. Started 1927 by a Mr - - Reed. Good "herd" of emus - the only ones have seen since the wild birds near Kalgoorlie Saw some of the country west of here. Forested flat as always in Australia, a Eucalyptus forest.. Country here well dissected + hilly - looks quite lush, but as ever in Australia in a serious drought.

4/23 Cairns, Australia

Hot sticky night. Left Brisbane about 4:30 yesterday - non-stop to Townsville well up on the "tropical coast". Overnight at the Sea View Hotel - This a wet tropical climate - chief crop in area is sugar cane. Numerous low moun-

fairs between Rockhampton and here - look like volcanic structures. Castle hill is very close to town. Beautiful coastal islands. Vegetation looks like tropical rain forest.

Arrived Cairns today about 5 PM. Had dinner courtesy of Ansett ANA. After getting back to airport bus were informed that Port Moresby airport closed down for bad weather. Airline put us up for the night at the Continental Hotel.

Country round here seems very lush & green sugar cane is main crop. Have had about 6 inches rain here the last 2 days. Everything is waterlogged. Cloudy tonight but no rain. Took cloud pictures today coming down to Cairns airport - unusually striking light effects, & numerous decks of clouds.

4/24 Awakened at 3:30 AM Yes black night morning. The group marooned here at Cairns was assembled by 4:30 AM. Bus to airport a bit later. Arrived at airport before 5 & left at 5:30. Still dark. Somewhat cooler out & Cairns. Beautiful dawn, with clouds to east.

Apparently 4 of the 18 passengers put over for the night at Cairns are US citiz. - at least seen from passports observed. Arrived Pt Moresby 8:30 AM. Confusion at airport on part of officials as to timing of departure. Took cab in to town. Changed money. Walked around Pt. M. Not very interesting. Seems a seriously dry spot on the N. Guinea map. Incredibly, Eucalyptus trees are the dominants, at least in areas partially deforested. Left Pt Mrsby at 11:30 on a "local" flight to Kokoda → Popondetta → Garaina → Lae. A strictly bush flight operation. DC-3 from Pt. Mrsby to Lae bucket seats, but with box lunches served

after leaving Popondetta. Picked up a number of Papuan children & their mothers at Popondetta all in bare feet. Interesting to watch them nurse their babies en route and even while eating lunch. Such a natural function is so out ruled by our curious sophisticated all it rules. in our societies.

Very fair light conditions for photography. Flew low enough to see structure & land & vegetation.

On Sunday, the - drove up the Itambo Lumber Co logging road - This is a narrow swath cut into the rain forest along the river flowing SW toward Lae. Followed road for about 4 mi when became too stony. Farthest point from Lae about 16 miles. This is the lushest vegetation I have ever seen and appears more dense than anything in Central America.

Monday. D's accident, about 4 PM on the road to Bulolo just beyond the Markham River from Lae. Got her to the Angau hospital in Lae within 1/2 hr. Serious contusion & deep wounds on inside of left ankle. Left her at hospital for the night. Feel ill.

A miserable night at the Cecil.

Monday April, Saw D in AM - no X-ray. Late in afternoon X-ray was done. No fracture. Took her back to hotel. Bad limp.

Sweating excessively again as the past few days. Diahrhoea again. This is about the 6th time since Cairo, the session in Nairobi was the worst, but the same old symptoms again.

April 29 Left Lae N. Guinea at 10 AM
rained for an hour before leaving. Landed
Pt Moresby one hour later (DC-6) Left
Pt. " about 11:30 - arrived Brisbane
at 4:45 - non stop - good flying except
over Australian coast. Arrived Sydney about
7:45. This is the longest time I've spent
on one aircraft since 1950 crossing
the Atlantic. Temp in Sydney 60° F
Put up at Metropole. Have felt poorly
for several days and took temp. tonight - 100.4
April 30. Slept until noon - temp about
the same. Got films + mailed package.
Temp about 100° all day. Took 12:45
PM flight to Wellington - New Zealand
air services.
May 1 arrived Wellington about 6:30
Temp upper 50's. Just getting light.
After some difficulty found room at the
Hotel St George - about the best hotel
accomodations since S. Africa.
Wellington is a smallish city draped
around the circular harbor. A crazy
quilt of houses surrounding it, perched
on the hills. Almost all the houses are
of wood!
To bed after supper about 9:30. Awoke
at 5:30 - temperature still 100° + ful

hardly refreshed for the sleep. Better this evening. Weather sunny but cool.

May 2 - Temperature near normal. Outdoors today only to go to the "chemist" and to the hospital. Very cool + blustery outdoors - high today 49° Semi alternate rain squalls + bright sun. Strong SW winds.

May 3. Dr Willett Pei of N.Z. geological Survey picked me up at hotel + drove me to the Survey offices in Lower Hutt. Spent a most interesting but somewhat tiring day there. Also visited a patch of Nothofagus forest along the Bay hills. A dark sombre dense forest cover of smallish trees. Wind a gale from SW heavy intermittent rain squalls. Cold - high about 48°

Temp. normal this AM, but got chilled outdoors today. Still weak + slightly dizzy.

May 4. Slept poorly - felt chilly. Temp this AM 101°. Doctor later - liquid diet for 24 hrs. Streptomycin pills + all day in bed.

May 5. Temp 97 this AM. Weak but feeling nearly normal for first time in over a week. Blood test negative for malaria, but high white cell count. Stayed in hotel most of day.

Rented a movie projector + went through the rolls of 8 mm film taken between So Africa + Ceylon - Unexpectedly good results: Weather good today

May 6 Checked out of hotel this AM. A somewhat staggering bill £52/8 for 5 days. Weather very windy + delayed our DC-3 flight (TEAL airways) over an hour for departure to Rotorua. Too windy to land at Masterton so came down at Palmerston Royal - about 4 PM. Flew part Mt.

Tokerova - an endemic shell fish on west coast of N. Zealand.

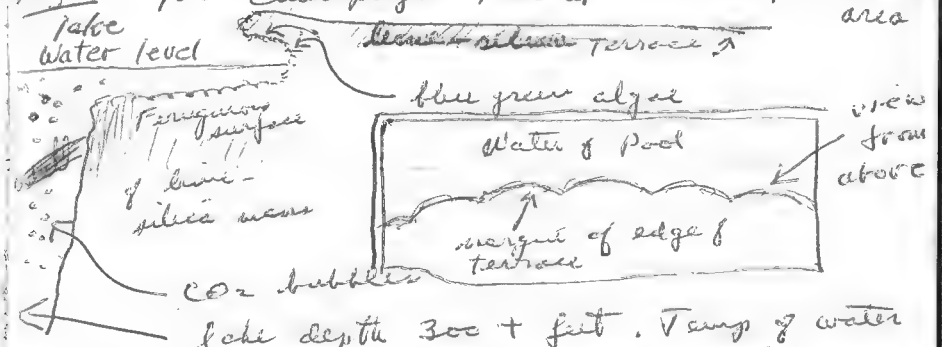
The highest peak on the North Island. An alpine-type peak about 9100 ft. - extinct volcano. Snow covered and spectacular since the plane was at same elevation as the summit a few miles to the east. Came down at Rotorua at 5:30, the valleys of N.Z. are remarkably green and picturesque - the farms a model of neatness the sheep nearly pure white, the meadows the most intense green. Pt. cldy and blustery in Rotorua.

May 7. To Geology. Sunny this AM - Mr James Healy, in charge of the Rotorua branch. Had a fine hour visit of much interest re volcanic history, recent history of area etc. Visited lower end of Whakarewarewa Thermal area - Maori Preserve - Maoris highly variable - very light to dark - caucasoid to somewhat mongoloid in face.

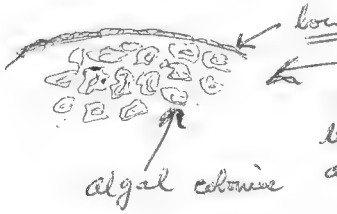
May 8th. Three hours at Whakarewarewa geyser basin (very near our motel, the Stateway) at Guestward Ho Motel in Taupo. The large geyser blew about 11:30, spouted up to 70-80' for nearly 35 minutes, a magnificent sight. Weather very clear, cold (heavy frost on car this AM, snow on the ground) Left Whakarewarewa about 1:30, stopped at the Waiotapu thermal area. This is a wandering region but has accordingly a number of unusual features

what are "Tree tomatoes"? red ← 5 cal/x 10 hrs

May 8 The "Champagne Pool" at Waiotapu Thermal area




lake depth 300 + feet. Temp of water - 212° F. Area 22,000 sq ft.




including a very large seething boiling lake (above diagram) showing building out of terrace shelf over lake (+300 ft deep). Algae are concentrated on the lower lip of the overhanging shelf. This area high in sulfur. Also high in Ca

Water analysis of Champagne Pool water =

[ pine cone, collection of twigs, ferruginous silica biscuits + algal sinter specimens were all collected at edge of champagne pool. Sulfur samples from a steaming earth area 1/4 mi NW of there

May 9. Taupo. Weather perfect except cold very heavy frost. View across Lake Taupo as clear as glass - Mt Ruapehu (1975 m) snow white in distance (30 miles?) The volcanic cone smoking slightly (Mt Ngauruhoe + 7515 ft).

Spent day at the Waiotapu Geyser Valley. This is the most thermally active area of N.Z. Series of faults along and between which literally thousands of steam vents + boiling pools occur. Close to the Geyser Valley reserve is the large geothermal steam turbine electric plant. Sufficient steam arises here to strongly affect the local cloud formation + cover.

May 10 Taupo. Dull grey day. Left motel about 11 AM. Packed up samples + labelled collections to-date - Most of the rock samples from Waiotapu area. Spent several hours in area of the "wild" steam hole (204/A). This hole bored to 1200 ft went out of control. Threw out 400 tons concrete poured in to choke it. Now a huge mud cauldron - ca 200 ft circumference. Drilled in 1960 or '61 - they say little change in past few years but can't believe it. The earth quakes very noticeably within a quarter mile or more from the area. Close to, large masses of earth + parts of the hillside are continually a-tremble. Very noticeable vertical motion when within 100 feet. The crater spouts mud + water up about 30 feet or more at very irregular intervals. Low volcano This is probably the largest geyser now operating in New Zealand, although no where near as high as the Whakarewarewa geyser. A cold grey day + thoroughly

Called on Mrs Fookes, Chief Eng. Wairakei Project today

chilled by sundown. Drove to Orakei Korako by dark. Had a temperature of 101° tonight. Bed right after supper. Very miserable

May 11. Orakei Korako - Much better today. Up at 7 AM Cold. Heavy mist over valley - didn't lift even under a cloudless sky until nearly 10:30. Took boat over before noon. The terrace by the river is landing point - ca 600 - 1000 ft from the south bank. The water level here is controlled by the Ohakuri dam on the Waikato River. Water level raised 65 feet by the dam. According to accounts this has increased the thermal activity, or at least the flow by 100%.

[ The so-called emerald terrace is reddish-yellow in summer? ]

Cloudless sky all day - a perfect day.

Custody of the thermal areas here is somewhat emphatic. The adjoining land belongs to the State, but is let out in leases "in perpetuity". The Waitapu lease is to Mrs Farquhar - from her mother - and goes to her son. The one here at Orakei Korako is to a Mrs Pascoe - The area is "private" land, but is not "private" land. A somewhat similar situation to our former "concession" property. The level of cleanliness on the part of visitors here, however, is extraordinary. We're told today that as many as 800 come here per day during the summer holidays - Bath in the thermal pool tonight! Good!

May 12. Orakei Korako. A dull dawn. Very misty in this narrow valley. Went back to the hot springs & water terraces at 11:30. Collected more samples from the "Golden Fleece" terrace - cool water but hard smelling. Also more of the problematical algae from the near boiling Fred & Maggie cauldrons. This will require a microscope preparation to understand. The maximum tolerance here, if algae would be about 200° F - This does not seem at all possible. Most of the algae in the N 2 hot springs seem to die off at about 145°-150° F - perhaps a bit above this. They seem to have an "optimum" at about 120° - 125° F, depending on the mineral-gas proportions - also do very well at lower temperatures.

Cleared off to a fine afternoon. Left O. Korako about 2 PM. Very reasonable tariff - 25 shillings per person per night. Went back up road past Waitapu

and turned off to see the Waimanga area - too little time. This is a very large thermal area including a 10? acre boiling lake. Some of the most interesting algal structures here, but very little time to observe. Becoming dark as we get back to Rotorua. Problems again with getting a room. There seems no end to the vacation - travel problem here - it is either Easter or school holidays or Queens birthday or what not.

May 13 Cold grey rainy morning at Rotorua. Finished packing specimens. Hair cut (4/4) P.O. Sent 3 parcels totalling 40 lbs more or less. Becoming warmer, with N.W. wind, partly clearing. Left Rotorua about 2:30 PM. Rather uninteresting country except for a few areas of forest land. These are quite extraordinary in the representation of tree ferns - along wooded areas the tree ferns crowd in to the edge of the highway on both sides. Cyathea? Difficult driving north of Hamilton because of fog along the Waikato River. Reached Auckland about 8 PM. Same old problem finding a place to stay. Quantas solved it out of the problem & are at the Coburg Hotel on Queens St. @ 50 shillings per! Mild & very damp here tonight compared to the cooler weather in the Rotorua - Taupo area - also very damp.

In most of the entire area of New Zealand North Island thus far seen & there is little evidence of any of the original forest cover - most of the land is pasture of one sort or another - even on quite steep slopes. One is led to conclude that the New Zealand forest cover was destroyed with even greater efficiency than that of the U.S - perhaps more of the area within even binocular view of the road is original vegetation, except on the steep mountain slopes. The introduced pine forest, however, is quite incredible - far more vigorous than the same in the U.S or other native lands from which it was brought - Mexico etc.

May 14, Left Auckland via car park - paying hotel bill, American Express and a hurry up trip to Whar--- Airport. Got aboard plane in good time. Dec found no duty free shops selling Pava items - all 20% New Zealand tax items. Only items sold at the tax exempt store are the same old items everywhere - cameras, lenses etc.

Left Auckland for Noumea at 11:30 N.Z. time. The plane course was mainly far west of N.Z.

Passed over Norfolk Island - at 1 PM N.Z. time. Seemed so small from our altitude: Next land fall New Caledonia (a few sq. miles)

On landing, the most conspicuous trees are Eucalyptus?? - so called mour - look like Eucalyptus.

The mountains of New Caledonia are low, but with sharp relief: Most of the 50 KM in to town through country long gone by as "native" - mostly cow + beef pasture - same as New Zealand and most of the U.S. SW. Local scenery along the way was Tractors, bulldozers, over-grazed fields and occasional automobiles. Same general scene in U.S. - cattle areas. The city of Noumea is choked with auto mobiles, occasional dogs + cats. In general it is a nice city and certainly remarkably unlike what I had expected - Somewhat like Lourenzo Marques in E. Africa except on a much smaller scale.

Temp. at Noumea 80°F at landing. Clouds were strictly to cumulo-stratus

Opened mail on plane today - letters letters, letters. - VG

NG May 15 - The beach at Noumea is excellent

NG May 16 although the water a bit cold at this time of year - 74°.

May 17. Left Noumea at 730 PM. En route to Nandi
Saturday (16th) had pleasant day on beach just outside our "Motel" - the Nouvata Bungalow - accommodations very good - private bath & good bed. The beach very clean. Water temp 74°F got chilled. Fever again all day Sunday (17th) 101°F again. Sweat all night - down to normal today (18th) right ear completely plugged up & deaf. Drove out to Bouleparis & took road north toward Thio - wrong time of day to enter going north. At point of turning back some of the forest vegetation, probably largely indigenous forest began to appear. All the vegetation on west side of island is deforested cattle land - very uninteresting except for the views of the central mountain range. There is nothing to this part of N. Caledonia to recommend it to the traveller except for the very fine aquarium at Noumea. — Dugong 5 ft length - 120 lbs
Saw two cagou birds in captivity behind the "hotel" in Bouleparis. Dont look too closely at the barnyard behind the hotel! Looks like So. France!!
NB. Nickel smelter fumes can be seen 60 miles or more out at sea NW of Noumea - blown seaward by the SE Trade wind. A somewhat ghastly sight blotting this South Pacific air. 5 or 6 huge stacks belching yellow - grey smoke.
Many signs on the island - i.e. the SW end where ore has been pulled out leaving huge red scars on the lower mountain slopes.
May 18 Souva, Fiji Is.
Arrived Nandi at 10.30 local time. Despite requests in ~~Nandi~~ Noumea were booked at another "hexay" place - the Mocamba Hotel (F5/10 per night) A very new place with cement scarcely dry, air conditioned etc etc. Could not open the windows.
This AM clear & pleasant - Fiji is a mountainous island, low volcanic mountains & green, all around us and below from this low hill on which the hotel is situated are cane fields. Small locomotives pull the cane cars in great trains.
Took bus from Airport at Nandi. No breakfast

because of the hour. Been left Nandi (Nadi) at 10 AM
Stopped for lunch at 12:30. All AM through cane fields
After lunch began to come into areas of forested hills
& hillslopes remarkably featured by tree ferns. — These
unlike the N.Z. forms (Dicksonia ??). Very hilly
& wooded countryside until within 25 miles of Suva.
Observations — almost no rice cultivation, no maize
seen at all. Considerable yuca, some taro.
coconuts very abundant — copra. No rain, but
cldy over the hills.

Tonight at the Garrick Hotel. After dinner walked
thru town and ended up at the town wharf — saw
a fine two master at the ship. Turned out to
be the Te Vega — one of the I.O. Exped. vessels.
Invited aboard. Dr. Berry of Antioch College
was very cordial & hospitable.

May 19. Went to Suva Hospital today for examination of
plugged ear. The Fiji nurse there tried her best, but no
success in dislodging wax plug. Spent the afternoon on
the inner coral reef on invitation of Dr Berry & Dr Wolff
of the Te Vega. A fascinating living museum of corals,
echinoderms, holothurians, algae, fish etc. This reef is
about a mile from the outer fringing reef and ca 2-3
miles from Suva quay. Two largish (5000 ton ?).
Russian oceanographic vessels came in to the harbor & tied
up at the pier late this afternoon. Well staffed (many
women scientists or wives aboard). One ship registered
out of Vladivostok, the other I couldn't read. Had dinner
aboard the Te Vega — very good meal indeed pre-
pared by a Tongan chef. The ships doctor — Dr
examined my ear tonight, removed most of the wax and
found a "going" infection of the outer ear canal!
Weather today perfect — sunny all day until about 5 PM

May 20 — Suva — Taxi to Nandi via the "Kuiga
Road" — North round the island. Took about 6 1/2
hours exclusive of stop for dinner — ca 160 miles to
Airport at Nandi. Worthwhile to see this side of the
island, although almost all deforested and given
over to cattle land & grass. Some forested areas on
upper slopes. The forested areas are not all limi-
ted to coastal regions, which is puzzling since
many interior areas, as seen from the road are
deforested?

Mr Jimmy Singh got us to the airport at 10:15
PM. Nothing to do. Went up to Tavua Hotel &

waited it out with the help of the very friendly staff of this very new hotel-motel. All Fijian (+ Indian)

Plane left Nandi at 2:25 AM for Papeete, Tahiti. Landed at Papeete at 8:30 AM on Friday the 21st according to Suva time — However here it is 8:30 May 20. —

Went to Clinique Cordella — (500 F) for inspection of ear infection. The doctor (Dr — ) is sure that it is an infection only of the outer ear — so prescribed medication. I am not certain, but this is the best I can do. Put up at the Motel MATAVAI — a pleasant place with individual "bungalows" of pseudo "Tahitian" architecture. There seems to be no remnant left of Polynesian culture here except the color of the "natives" — a number of which are obviously Chinese. Scooter bikes are everywhere — if out of sight not out of sound.

The mountains of Tahiti (7500 Ft ?) are superb — there is no doubt it is a beautiful island from the sea. Too bad so different from the shore.

May 21. Rented a fiat out old Fiat 600 for $12 US/day plus 9¢/km. Car dirty as is the whole town of Papeete (something like those filthy towns in southern France, except it goes on forever along the shores of this all too small islands.

A curious mixture of breath-taking views and breath-taking smells. Purchases in town — town Market!

| | | |
|---|---|---|
| 2 avocados | — 45 F (= 5.2 ¢ US) | These are the highest prices I have ever seen for local produce) |
| 2 limes | — 25 F (= 3¢ ¢ US) | |
| 2 coconuts | — 20 F (23 ¢ US) | |

In general there are truly exhorbitant prices for native crops — especially in an area where production is at lowest possible cost in time and labor. Reason — No incentive to work. This is the real culture of French Polynesia — No work — just live off the tourists. (13,350 per year) !

Took road out to Venus Pt (Here Capt Cook was commissioned to observe the transit of Venus in 17 . . Also at Venus Pt was a grass thatched hut with historical documents in French, English and Tahitian. It states that Cook was commissioned to go here to this spot to observe

The famed transit of Venus in 17- - ) - I wonder if this is true? Did they have this degree of finnesse at that time to send an expedition here?
Also learned at Pt Venus that the Missionary Society of London sent an expedition to Tahiti & the neighboring islands in 1797 to teach the unity of God or Christ to the heathen. It didn't take too easily, but apparently they succeeded. Puzzling thing is that Tahiti is pure Catholic (church of Rome) and the 1797 missionaries were 'pure' Protestant. ??? And why are the Fijians also nearly pure Catholics whereas the island is essentially a 'Crown Colony' despite the present confusion of Australian & New Zealand administration?
Drove out about 35 KM on the northern road - only a few times en route out of the site of a house (the "Villages of 'Tahiti" -
A tour of Tahiti going OUEST NOT OUEST consists of driving through a melange of traffic going in the other direction (with no direction) multitudinous motor scooters and cycles driven almost exclusively by "natives", also by "Europeans" - the main streets are dominated by 2nd or 3rd rate shops chiefly operated by chinese. The town market is a farce - apparently operated only for the gullible tourist. ⟶ RUE DE GENERAL DE GAULLE

General Impression ⟶

General De Gaulle was a great man when General Eisenhower took him through the Champs Elysees and made it possible for him to strut his present rôle

De Gaulle is now a big boy with his ATOM BOMBES

Impression of Tahiti - A somewhat pathetic attempt to attract 'world tourists'. A - it is difficult to say, but - if the place would calm down a bit - it might be better off. They will never make it as a tourist haven. Too bad for the publicity. Too much smell of urine and all the other embellishments of France - especially Southern France where the

Smell of fresh urine is in the air, Vive La-France. They have almost reached this stage in Tahiti (Papeete) — A dirty little village in the Pacific

In general — a dirty little town trying to be something it can no longer be — i.e. an appealing place for visitors. It stretches out for 20 miles (or km) to the effect that it can never be appealing. Except for the ballyhoo — Tahiti is to be regarded as largely a sad chapter in the American adventure in the South Pacific. It should have gone much farther than Hawaii and the other islands. We do have a precarious hold in the great Pacific now. Despite the present war in Viet Nam.

The only real security for the U.S. is to hold Viet Nam and to ally ourselves as closely as possible to Australia and N. Zealand as possible. This is very important as long as that maniac Sukarno is free. He is a genius at making trouble, aided by chopsticks. (

Dance + show tonight at Metavai Hotel except for the fire dance (tamboo strips with oil soaked rags) it was a good hip show — How these girls can swirl their hips in this way, despite all the years of missionary pressure is a mystery to all. Perhaps the missionaries (London Mission (1797)) didn't do too good a job, although they did otherwise

[redacted]

May 22 — Papeete — The dirty little village in the middle of the clean Pacific Ocean.

The whole show last night (the roosters are now crowing) was so well behaved — seemed almost like the rooster show in a state Fair. Seems as though everybody loved everybody.!!

Names of "Harvard Peabody Foundation in Research on Tahiti" etc.

Cost of vegetables & fruit in ~~Tahiti~~ Papeete Market

tomatoes — 120 F per kilo
pineapple — 70 F " "
mango — 15 F for three small ones
squash — 240 F for about 5 lbs

[Price of copra in Fiji (Suva) = ₣10 ¢ per lb.]

grapefruit = 20 F for one large one
avocado — 45 F for 2 large fruits
coco nuts = 10 F each (any size)
papaya = 15 - 25 F depending on size
taro —
coco nuts — 10 F each
yam —

and thus on an island with the most fantastically fertile soils

[Number of tourists visiting Tahiti (French Polynesia en toto) last year was 13,200]

Difficult to analyse this place (why should one analyse)?)

May 23. Spent the afternoon on the beach beyond Punaauia - a very fine day - nearly clear all afternoon. The temperature of the sea here is considerably higher than in Fiji, probably near 80°F. This beach is scarcely a superior one - too many pebbles & cobbles of vesicular basalt - in fact there are very few good beaches on this island, as seen thus far. Black sand beach at Pt. Venus is unusual but steep & uninviting. The light house here (dated 1867) is a structure closely resembling the churches in the interior of Panama - white washed with algae & plants growing out here and there. A "grass" thatched hut here contains the recorded history of occupation of Tahiti, starting with Capt. Wallis in 16 - and also describes the accomplishments of Capt Bligh and his well known accomplices - The Bounty. A rather good description of the history of Tahiti is to be found in a thatched sketch on Pt Venus - to the SW of the light house (which seems to be unnaturally well grounded).

May 24 Drove around the entire island today - a rather dull, cloudy day. The scene is the same - except with minor variations. There is no real native culture here, absolutely none. Perhaps the fact that the Polynesian population in 1864 fell to about 7200 has something to do with it. The present population is far more French than Polynesian. The better off natives build houses of concrete, thatched or metal roofed [The tourists stay in thatched huts - a curious cultural inversion]

May 25 A mad rush to get to airport. Had to drive in to Papeete to retrieve my Am Express card - also had to pay cash for car rental in cash - No credit even with card $42 ±.

11:15 - socked in thick in clouds at 31,000 ft - probably now near the equator at Long. 170° W The intertropical convergence zone. The Captain of the plane says nothing of our whereabouts in the Pacific. Seems strange because many men would literally give their eye teeth to see the whole of the South Pacific in a day from 17° S to 21° N in one day. Passed thru two major

airo-annulus systems today — one at probably about 4° S and the second at about 4°–6° N latitude. After that no turbulence. Landed in Hawaii on schedule (about 2:30 PM).

Hawaii — Seems typical U.S. except for the tourists here who seem to be having a good and very respectable time. A large proportion are of age beyond 55 and a fair proportion seem to be of Israeli extraction. Most hosts & hostesses are of Chinese or Japanese appearance. The persons in charge appear to be primarily of U.S. or otherwise Eizean origin. Same old story.

VG

May 26 — M.D. first thing — middle ear infection. — Penicillin shot — arm —

Good dinner — $12.00 (plus tip) D.D likes to give tips. — seems very unhappy unless I tip very or at least quite generously — a good Boston habit if you can afford it — or think it right. On the beach at 4 PM. There seems no way to get to the beach early. Stayed until 6:10. Dee Dee very happy.

May 27. 8:30 — another penicillin shot (Dr. — Dickey of the Wakaitu Medical Center. (Quite pretensious) How many hours of the past month have I spent in M.D. offices ?????. — how many more. D.D seems to like it. She seems to like clean, sterile things. Probably they give her a sense of security — she seems to be positively obsessed with the th — need or sense of security — why I do not know.

NG
NG

May 27 — 8:30, Beach at 1:30. Waikiki a poor beach. Dirty in the wave zone — cigarettes — pieces of tin cans, old bottle tops & general dirt plus scum — outer zone — Not clear. Much dead cord with dangerous pillars on the near shore — Not really a nice beach.

Waikiki — dinner tonight (very good prime ribbs) — $12.00 — !!! — (includes 4 drinks).

Another American Town — no charge extra for the flat accent and the mid-western twang. Scattered showers on the beach — really very little rain. Sun light efficiency about 60%

of normal.

Code to Samples

SW M = Moodies Formation
lower Agnes Mine – serpentinite
from mine dump. 2/24/65

SW FT 1 = Fig Tree
Mine dump, Sheba Mine
Chert + black shale 2/26/65

SW FT 2 = Fig Tree shale
Road cut 1 mi above
Sheba Mine on rd to Barberton

SW FT 3 = Fig Tree Iron
formation. On road cut
above Daylight Mine, Barbrook
Mining Co. ~~(Lower Greek area)~~

friends, too.

# WEATHER DETAILS

## WARNING

GALE warning for Victorian waters, Port Phillip Bay and Westernport Bay. Road weather alert for motorists in Melbourne. Winds to gale force and showers will increase road hazards.

Cold snap warning. Farmers and graziers are warned of further cold winds and rain.

## FORECASTS

**VICTORIA.** — Cold and cloudy with showers in southern districts and about the ranges with scattered hail and snow on the Alps. Only isolated showers in the north and north - west. Strong and squally west to south-west winds.

**OCEAN.** — Strong to gale-force north-west to west winds tending west to south-west with severe squalls. Seas rough to very rough with heavy south-west swell.

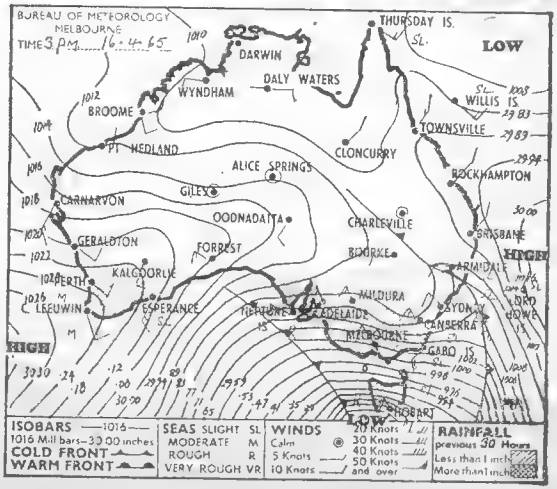
**CENTRAL VICTORIA.** — Cold and cloudy with showers, at times with local hail. Strong squally west to south-west winds. Gales about the coast. Very rough seas.

**PORT PHILLIP BAY.** — Strong to gale-force north-west to southwest winds and rough to very rough seas.

**CITY.**—Cold with showers, heavy at times, some local hail, strong squally north-west to south-west winds.

## Temperatures

| | Max. | Min. |
|---|---|---|
| Melbourne .. .. | 63 | 49 |
| Brisbane .. .. .. | 82 | 63 |
| Sydney .. .. .. | 85 | 64 |
| Canberra .. .. .. | 62 | 53 |
| Hobart .. .. .. | 58 | 49 |
| Adelaide .. .. .. | 66 | 55 |
| Perth .. .. .. .. | 69 | — |
| Darwin .. .. .. | 89 | 76 |




GALE-FORCE winds and rough seas prevailed over much of south-east Australian waters during yesterday. It was cloudy in most of Victoria during the day and temperatures were mainly in the 60s. Mt. Beauty and Bogong both reported a temperature of 34 degrees at 3 p.m. There was little rain during the day, although many places received moderate falls on Thursday night associated with thunderstorms. In Melbourne 48 pts. were recorded in 17 minutes and this was the most intense rain in the city since February, 1958.

The flow of cooler air followed the cold front which has moved to the Tasman Sea. An intense depression was located at 6 p.m. south of Tasmania and a secondary depression was developing just west of Tasmania. An anti-cyclone was centred over the southern Indian Ocean. The secondary depression is expected to move eastward and an associated cold front is expected to extend rapidly across Victoria. Conditions should be moderating by tomorrow.

## Time and tides

**TODAY**

**Sunrise:** 6.50 a.m **Sunset:** 5.53 a.m.

**Moonrise:** 6.47 p.m **Moonset:** 7.44 a.m

**TIDES**

**Williamstown.**—High: 3.42 a.m., 4.31 p.m. Low: 10.16 a.m., 10.44 p.m.

**Port Phillip Heads.**—High: 12.51 a.m., 1.29 p.m. Low: 6.43 a.m., 7.21 p.m

**TOMORROW**

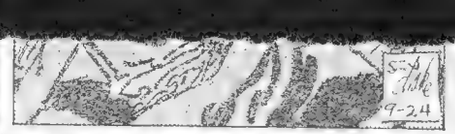
**Sunrise:** 6.51 a.m. **Sunset:** 5.50 p.m.

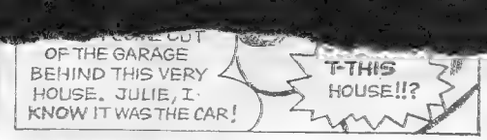
**Moonrise:** 7.18 p.m **Moonset:** 8.48 a.m.

**TIDES**

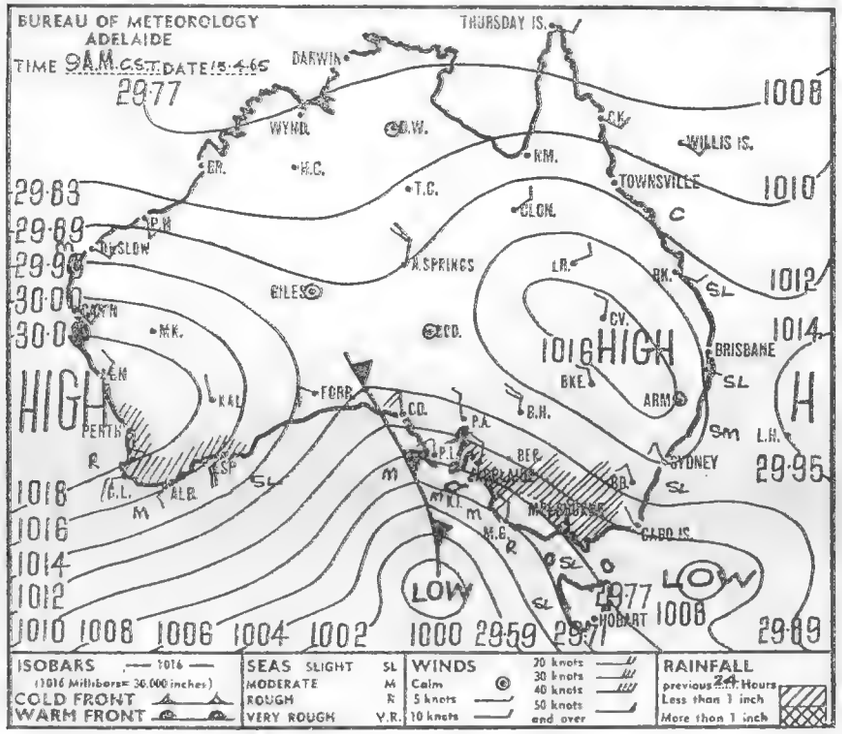
**Williamstown.**—High: 5.20 a.m., 5.21 p.m. Low: 10.59 a.m., 11.25 p.m.

**Port Phillip Heads.**—High: 1.33 a.m., 2.13 p.m. **Low: 7.27** a.m., 8.06 p.m.






# TODAY'S CHART




**Lighting-up time—6.23 p.m.**

## Forecast

**Bureau forecasts for today and tomorrow:—**

**CITY.**—Fine at first, with freshening north to north-west winds. A colder squally west to south-west change developing later today with a few showers. Seas becoming rough.

**STATE.**—Fine throughout at first with north to north-west winds, fresh to strong and squally in coastal districts. A colder squally west to south-west change developing over the far west today and extending to the remainder of the settled areas by tomorrow, with scattered showers. Rough seas.

**WARNINGS.**—A strong wind warning is current for all South Australian coastal waters, and a gale warning for southern ocean waters.

**EXPLANATORY NOTES**

The rain resulted from shower activity associated with the passage of a trough of low pressure.

A low is centred south of Adelaide with a cold front extending northwards and a ridge of high pressure extends east across Western Australia.

Systems are expected to move south-eastwards and a west to south-west airstream is expected to become established over the southern half of the State.

## IN OTHER STATES

**BRISBANE: Fine. Estimated maximum 84 deg.**
**SYDNEY: Fine. 71 deg.**
**MELBOURNE: Evening showers. 68 deg.**
**HOBART: Mainly fine. 59 deg.**
**PERTH: Fine. 70 deg.**

## SHIPPING

**ARRIVED TODAY**

Kibi Maru, Botany Bay; Troubridge, Port Lincoln.

**DEPARTURES**

Wareatea, Hobart.

**VESSELS DUE**

**Today.**—Australian Progress, Port Pirie; Amplecta, Kwinana.

**Tomorrow** — Anne Lise Tholstrup, Hongkong; Eastern Argosy, Hongkong; Vanoise, Dunkirk.

**Tomorrow's Tides at Port Adelaide — High water, 5.18 a.m. (7.6 ft.); low water, 11.06 a.m. (1.4 ft.); high water, 5.28 p.m. (8.7 ft.); low water, 11.32 p.m. (1.1 ft.).**

## WATERSIDE WORKERS

AUSTRALIAN STEVEDORING INDUSTRY AUTHORITY.

ALLOCATION OF LABOR FOR THURSDAY, 15TH APRIL, 1965.

MIDNIGHT STARTS FRIDAY, 16TH APRIL.

Gangs X17, 62. 7. Spare 1531. C/Ds 1785, 980. Freezer. 11.40 p.m. bus, 2 Outer Harbor.

8 A.M. STARTS, SATURDAY, 17TH APRIL.

Gangs X59, 2. Out 149, 622. Out and in 1397, 85. Spare 1302 C/Ds 1525, 1334. Cooler. Berth 2.

Gangs X67, 43. Spares 1537, 1770, 1561, 1699, 132, 1633, 1698. C/D 848. T/Ms 1529, 1344. Freezer. Berth 10.

Gangs X15, 52. Spares 149, 128, 919, 457, 1739, 204, 1714, 1210. C/Ds 266, 444, 96. T/Ms 664, 1320 477. Freezer. 7.40 a.m. bus and dinner. 2 Outer Harbor.

MIDNIGHT STARTS SUNDAY, 18TH APRIL

Spares 630, 693, 445, 559, Berth Musgrave

Spares 1190, 808, 1113. T/M 887. Berth E.

8 A.M. STARTS MONDAY, 19TH APRIL.

C/D 939. Berth 2.

Spares 1597, 382. C/Ds 39, 1691. T/Ms 712, 1199. Berth 20.

C/Ds 929, 1676, 860, T/Ms 1147, 965. Berth G.

C/Ds 389, 1067. T/Ms 631, 969 662. 8 a.m. bus, 4 Outer Harbor.

That completes this allocation.

## TENDERS AND CONTRACTS

ENGINEERING & WATER SUPPLY DEPT.

TENDERS received at the Director and Engineer-in-Chief's Office, Victoria square, Adelaide, to noon on 12th May, 1965, for the following:

(a) SUPPLY AND INSTALLATION OF SEWAGE PUMPING PLANT COMPRISING TWO CENTRIFUGAL PUMPS, TWO ELECTRIC MOTORS, ONE VENTILATING FAN AND ANCILLARY EQUIPMENT AT MOUNT GAMBIER No. 6 SEWAGE PUMPING STATION. (Specifications, etc., £5 per set.)

(b) SUPPLY AND INSTALLATION OF SEWAGE PUMPING PLANT COMPRISING TWO CENTRIFUGAL PUMPS, TWO ELECTRIC MOTORS, ONE VENTILLATING FAN AND ANCILLARY EQUIPMENT AT MOUNT GAMBIER No. 2 SEWAGE PUMPING STATION. (Specifications, etc., £5 per set.)

(c) SUPPLY AND DELIVERY OF SEWAGE PUMPING PLANT COMPRISING TWO CENTRIFUGAL PUMPS, TWO FIXED SPEED ELECTRIC MOTORS AND TWO DRIVING SHAFTS FOR LARGS NORTH SEWAGE PUMPING STATION. (Specifications, etc., £2 per set.)

Specifications and drawings at above office and copy obtained on payment of amount shown, which will be returned to unsuccessful tenderers who have sent in a bona fide tender, on return of documents in good condition within two months of closing date.

Each tender must be enclosed in an envelope suitably endorsed "Tender for—

(a) Pumping plant at Mount Gambier No 6 Pumping Station.

(b) Pumping plant at Mount Gambier No. 2 Pumping Station.'

(c) Pumping plant at Largs North Pumping Station."

And posted to Director and Engineer-in-Chief, Box 641F, G.P.O., Adelaide, or delivered to Plan and Tender Room, 1st Floor, E. & W. S. Building, Victoria square East.

No tender necessarily accepted.

## MACHINERY

ADELAIDE Engineering buys good machinery. 51-2241.

able that you'll lose. everything keep your marriage happy, and intact.

**LIBRA** (Sept. 24 to Oct. 23). — When there are practically zillions of good

Lucky Numbers.—Nos. 2 and 4 rule April 16.


# ROYAL AUSTRALIAN SURVEY CORPS

# LITHOGRAPHIC TRADESMEN

Qualified men and those suitable for training as LITHOGRAPHIC CAMERA OPERATORS, RETOUCHERS, PLATE-MAKERS, and PRINTERS, are invited to enlist in the Regular Army for service in the Royal Australian Survey Corps.

QUALIFICATIONS: Qualified applicants must pass the appropriate Army Trade Tests. Trainees must hold the Victorian Intermediate Certificate or equivalent.

DUTIES: Lithographic tradesmen are engaged in color reproduction of military maps, naval, and aeronautical charts. Service will normally be in Army Headquarters Survey Regiment, Bendigo, Victoria.

TRAINING: Trainee lithographers will be trained at the Army Headquarters Survey Regiment and by attendance at Melbourne School of Printing and Graphic Arts. Trainees will qualify as tradesmen at the completion of the training.

AGE LIMITS: Over 17 and under 43 for qualified men, and over 17 and under 24 for trainees.

SALARY: Pay and allowances at the new and attractive Regular Army scales, determined by rank, trade qualifications, marital state, and whether living in or out of camp, operate during training and service thereafter. Minors are paid full adult rates.

APPLICATIONS: Full particulars as to lodgment of applications, conditions of service, pay rates, an dcareer opportunities may be obtained from:

DEPUTY ASSISTANT DIRECTOR OF SURVEY,

Headquarters Central Command,

KESWICK BARRACKS, ADELAIDE

Telephone 53-9911.

shores of the Huon Gulf and the slaty blue skies behind the mountains in the clouds. The shrill cadence of multitudes of insects in the cloud covered forests of New Guinea - the exotic sounds of the forest birds. The sheer grandeur of the ever-wet tropical forest.

The 'greenest of the green' valleys of New Zealand with their white sheep. The steaming fumaroles and bubbling, boiling springs. The Geysers of

May 15- New Zealand - the boiling Lakes

The mountains of New Caledonia. They reach into the sky, yet they are not really high. What is on their other side? This we will never know until another visit.

Fiji - Viti Levu - there is another island Vanua Levu - The cane fields of Fiji - these are immense. The mountains to the north. The dirty two side- Suva - copra ——

May - Papeete - A dirty little French village in the middle of the clean Pacific - the prices in the market - a fantastic sight.

Mt Kenya rising above the plains
north of Nairobi
The incredible brilliant green pattern
of the mountain side tea plantations
of Ceylon

April 17 The incredible commercial and
business activity of Singapore
The grass trees of S.W. Australia
(very limited to coastal area - up
to 50 mi. inland between
Perth and Kalgoorlie
The eucalyptus "forest" of western
Australia
The "outback" around Alice
Springs & the barren desert to
the south of there -
Those "lifeless forests" with death
drooping branches of the limbs of
trees - endless open "forests"
and the skin lined carcasses of
dead cattle. - a spectre of how
drought can kill a hopeful land -
- the skin and the teeth were nearly
as they were - but nothing more -
nothing inside.

May 7 The fantastic mountains, rain
forests and flashing white rivers
of New Guinea's north slopes. The

After 2 weeks (Feb 5 - 20th '65)

1) Colliseum
2) Michelangelos "Moses" & other sculptures in Rome
3) Forum Romano -
4) Parthenon & the Acropylos
Mycenae
Epidaurus theatre
The great Pyramid of Khoufu (Cheops) and Tut Ank Amans riches
Nile Valley & the Egyptian & Sudan desert
Lake ~~Rudolf~~ Rudolf
Nairobi Park & the wild life
Mt. Kenya - the glaciers on south slope
The snow capped Kilimanjaro
Zambezi River in Mozambique from the air

also the 4 day diaries secured in Cairo

March 7th Hail storm in Johannesburg
Mountains of the Swaziland System of rocks in the Eastern Transvaal - Macaulays
Kruger Park - Giraffe
The Cape of Good Hope & the Cape Peninsula
The 28th level of the Drei Fontaine Mine in Rand - Carbon Leader & the incredible heat & humidity of the mine

March 28th
The grotesque yet beautiful Matopas Hills and their weird granite weathering pattern
The great falls of the Zambezi River - the roar & the clouds of up-flung spray
Kariba Lake & Kariba dam.

2/19/65 –

| | | | |
|---|---|---|---|
| | 1 – 10 | = | 10 |
| EB. | 7 – 20$ | = | 140 |
| | 5 – 50$ | = | 250 |
| | | | $ 400.00 |
| (DD. | – | | 130 ← gifts in Cairo for most part |
| | | | $ 530.00) |

2/20 – $ 50.00

---

– 3/7/65 –

checks cashed to date – ESB only.

| | | | |
|---|---|---|---|
| $ 10 | – 2 | = | 20.00 |
| $ 20 | – 8 | = | 160.00 |
| $ 50 | – 11 | = | 550.00 |
| 100 | – 2 | = | 200.00 |
| | | | $ 930.00 |

checks in hand 3/7/65 (excluding $ 500.00

| | | | |
|---|---|---|---|
| $ 10 | – 18 | = | $ 180.00 |
| $ 20 | – 2 | = | 40.00 |
| $ 50 | – 14 | = | 700.00 |
| $ 100 | – 13 | = | 1,300.00 |
| | | | $ 2220.00 |

---

| | | | |
|---|---|---|---|
| checks in hand 3/12/ | | | |
| 10. | 16 | = | 160. $ |
| 20. | 2 | = | 40. $ 2058.00 |
| 50. | 13 | = | 650. |
| 100. | 12 | = | 1200. |
| | | | 2050 |

11 AM - Feb 18

Mrs. Plumstead - Dept of Geology
University Tel. = 724-1311 (University)
Mrs. Plumstead - 724-3658
(Dept of Paleontology)
home # = 31-3982

ask for Douglas Smit house
opp main entrance to Show Ground
Bernhard Price Inst for Paleo.

if not there Dr. Brunk, vert paleo, - director
Prof. Hart

Dept of Geol. - in Univ. proper
Dr Mendelsohn

~~Port Consulate~~ -

| |
|---|
| 2220.00 |
| 930.00 |
| $ 3250.00 |

Total original
Am Express checks
excluding $ 500.00

March 10 - 14 boxes + 1 map roll = 273 lbs
at R.4.62 per 22 lbs = R.57.30
= $80.22

checks in hand 3/28/

| | | | |
|---|---|---|---|
| 10 | - | 10 | = 100 |
| 20 | - | 0 | |
| 50 | - | 10 | 500 |
| 100 | - | 11 | 1100 |
| [$400 extra] | | | $ 1700 |

Perth australia
checks in hand 4/9/65

| | | | |
|---|---|---|---|
| 10 | - | 9 | = 90 |
| 20 | - | 0 | |
| 50 | - | 7 | 350 |
| 100 | - | 9 | 900 |
| | | | 1340 |
| [+400 extra] | | | $ 1340 |

Coriolis experiments Feb 17 –
South Afr. – Jhb – Lat. 26° S.

** 1. bath tub – stopper drain 1 ft of water. Long tub, oriented direct E-W on long axis.
a) [illegible] perfect clockwise

* 2. Same as #1 ca 1' water depth started ↺ – ended ↻ results negative or inconclusive

** 3 same tub. Descending water column formed perfect clockwise cone

4 same conditions – descending water made perfect clockwise cone

5. different tub – oriented N-S – descending column counterclockwise

6 clockwise } tub in hotel in
7 clockwise } Barberton. oriented E-W.

8 c. clockwise – Cape Town oriented E-W

9. c. clockwise – 8" water N-S.

10. Clockwise – started with 10" water N-S.

11.

MINIATURE

# PERSONAL ACCOUNT BOOKS

**for home and office**

★

NO. 2044 OPEN STOCK

in following rulings

JOURNAL • CASH • S. E. LEDGER

RECORD • D. E. LEDGER

★

NO. 2044-A ASSORTMENT

consisting of

3 – JOURNAL 3 – CASH 2 – S. E. LEDGER

2 – RECORD 2 – D. E. LEDGER

Made in U.S.A.

BOAC —
Flight to Sel. on 9th ?
Mr McFarlan 834-3911

LFREDS EMPORIUM. TEL. 23 427
EVERYTHING PHOTOGRAPHIC
CNR. HAY & PIER STREETS, PERTH
...FFICE FLOREAT PHOTOGRAPH

Samples mailed:

Sediment + miscellaneous rock samples packaged in Johb. 3/11/: —

#1 — 14 = packages = samples from collections in the Swaziland System, Transvaal System, Witwatersrand (Carbon Leader etc) and Karroo sediments + Roll of Maps mailed at Braamfontein P.O. 3/12

ca 374 lbs
cost = R.57.75 = $

# 15 + 16 — packaged in Hotel (Victoria) (3/12) = miscellaneous Karroo shales (Hammerskraal) — and other rocks + papers (travel receipts etc)

2 unmarked packages from Bulawayo of rocks from Huntsmans Quarry + 1 p° granite

~~map roll from Nairobi sent by Mrs. Bailey~~

2 boxes from Kalgoorlie — 1 rocks, 1 miscella incl. used clothes

2 boxes (Kangaroo rug + misal from Perth.

2 boxes rocks from Alice Springs + 1 mailing tube.

Also sent by order:

—— *

2

1) – containing glossopteris

x

1

ellaneous